

GURU KASHI UNIVERSITY



Diploma in Computer Science & Engineering

Session:2026-27

**Department of Computer Science &
Engineering**

Programme Structure

Semester: I									
Course Code	Course Title	Type of Course	L	T	P	Credits	Int.	Ext.	Total Marks
DCS101	Applied Chemistry – I	Core	3	0	0	3	30	70	100
DCS102	Applied Mathematics - I	Core	3	0	0	3	30	70	100
DCS103	Applied Physics – I	Core	3	0	0	3	30	70	100
DCS104	English and Communication Skills – I	Core	3	0	0	3	30	70	100
DCS105	Engineering Drawing – I	Core	1	0	4	3	30	70	100
DCS106	Applied Chemistry – I Lab	Skill based	0	0	2	1	30	70	100
DCS107	Applied Physics – I Lab	Skill based	0	0	2	1	30	70	100
DCS108	English and Communication Skills – I Lab	Skill based	0	0	2	1	30	70	100
DCS109	General Workshop Practice – I	Skill based	0	0	4	2	30	70	100
DCS110	Basics of Information Technology Lab	Skill based	0	0	2	1	30	70	100
Total			13	0	16	21	300	700	1000

Semester: II									
Course Code	Course Title	Type of Course	L	T	P	Credits	Int.	Ext.	Total Marks
DCS201	English and Communication Skills –II	Skill based	3	0	0	3	30	70	100
DCS202	Applied Mathematics -II	Core	3	0	0	3	30	70	100
DCS203	Applied Physics-II	Core	3	0	0	3	30	70	100
DCS213	Basic Electrical & Electronics Engineering	Core	3	0	0	3	30	70	100
DCS206	English and Communication Skills –II Lab	Skill based	0	0	2	1	30	70	100
DCS207	Applied Physics-II Lab	Skill based	0	0	2	1	30	70	100
DCS214	Basic Electrical & Electronics Engineering Lab	Skill based	0	0	2	1	30	70	100
DCS212	Engineering Drawing-II	Skill based	1	0	4	3	30	70	100
DCS211	General Workshop Practice –II	Core	0	0	4	2	30	70	100
Total			13	0	14	20	270	630	900

Semester: III									
Course Code	Course Title	Type of Course	L	T	P	Credits	Int.	Ext.	Total Marks
DCS301	Digital Electronics	Core	3	0	0	3	30	70	100
DCS302	Computer Programming Using C	Core	3	0	0	3	30	70	100
DCS304	Relational Database Management System	Core	3	0	0	3	30	70	100
DCS305	Multimedia and Applications	Core	3	0	0	3	30	70	100
DCS311	Microprocessors	Core	3	0	0	3	30	70	100
DCS306	Digital Electronics Lab	Skill based	0	0	2	1	30	70	100
DCS307	Computer Programming Using C Lab	Skill based	0	0	2	1	30	70	100
DCS308	Relational Database Management System Lab	Skill based	0	0	4	2	30	70	100
DCS309	Multimedia and Applications Lab	Skill based	0	0	2	1	30	70	100
DCS312	Microprocessors Lab	Skill based	0	0	2	1	30	70	100
Total			15	0	12	21	300	700	1000

Semester: IV									
Course Code	Course Title	Type of Course	L	T	P	Credits	Int.	Ext.	Total Marks
DCS401	Generic Skills and Entrepreneurship Development	Core	3	0	0	3	30	70	100
DCS402	Data Structures Using C	Core	3	0	0	3	30	70	100
DCS403	Object Oriented Programming Using C++	Core	3	0	0	3	30	70	100
DCS404	Computer Architecture	Core	3	0	0	3	30	70	100
DCS411	Installation, Maintenance and Troubleshooting of Computer Networks	Core	3	0	0	3	30	70	100
DCS412	Operating Systems	Core	3	0	0	3	30	70	100
DCS407	Data Structures Using C Lab	Skill based	0	0	2	1	30	70	100
DCS408	Object Oriented Programming Using C++ Lab	Skill based	0	0	4	2	30	70	100
DCS413	Installation, Maintenance and Troubleshooting of Computer Networks Lab	Skill based	0	0	2	1	30	70	100
Total			18	0	8	22	270	630	900

Semester: V									
Course Code	Course Title	Type of Course	L	T	P	Credits	Int.	Ext.	Total Marks
DCS515	Basics of Management	Core	3	0	0	3	30	70	100
DCS516	Web designing And Development	Core	3	0	0	3	30	70	100
DCS503	Computer Networks	Core	3	0	0	3	30	70	100
DCS517	Computer Graphics		3	0	0	3	30	70	100
DCS518	Web designing And Development Lab	Skill based	0	0	4	2	30	70	100
DCS519	Computer Graphics Lab	Skill based	0	0	2	1	30	70	100
DCS509	Minor Project	Skill based	0	0	2	1	30	70	100
DCS510	Industrial Training /Internship (4 Weeks)	Skill based	-	-	-	2	30	70	100
Discipline Elective-I (Any one of the following with its Lab)									
DCS520	Software Engineering	Discipline Elective -I	3	0	0	3	30	70	100
DCS521	Network Security								
Total			15	0	8	21	270	630	900

Semester: VI									
Course Code	Course Title	Type of Course	L	T	P	Credits	Int.	Ext.	Total Marks
DCS612	Internet of Things	Core	3	0	0	3	30	70	100
DCS613	Artificial Intelligence	Core	3	0	0	3	30	70	100
DCS614	Computer Programming using Python		3	0	0	3	30	70	100
DCS615	Java Programming	Core	3	0	0	3	30	70	100
DCS616	Computer Programming using Python LAB		0	0	4	2	30	70	100
DCS617	Java Programming lab	Skill based	0	0	4	2	30	70	100
DCS607	Major Project	Skill based	0	0	4	2	30	70	100
Discipline Elective-II (Any one of the following with its Lab)									
DCS618	Big Data	Discipline Elective -II	3	0	0	3	30	70	100
DCS619	Natural Language Processing								
Total			15	0	12	21	240	560	800
Grand Total			89	0	70	126	1650	3850	5500

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, °Cl, °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 & Avogadro'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 (K_w), 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

SEMESTER: I**Course Title: Applied Mathematics-I****Course Code: Dcs102**

L	T	P	Credits
3	0	0	3

Total Hours: 45**Course Content****UNIT-I****10 Hours**

Algebra: Complex Numbers: Complex number, representation, modulus and amplitude. De-moivre's theorem, its application in solving algebraic equation. Basics and properties of logarithms and its applications in solving problems related to basic logarithmic formulas. Geometrical progression, its n th 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 nPr and nCr . 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 e^x . 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), intersection 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.

Course Title: Applied Physics-I**Course Code: Dcs103**

L	T	P	Credits
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, $y = r \sin t$, 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-IV**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

Course Title: English and Communication Skills – I

Course Code: Dcs104

L	T	P	Credits
3	0	0	3

COURSE CONTENTS:

Total Hours: 45

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 Moksha Gundam Visvesvaraya.

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;

Course Title: Engineering Drawing - I

Course Code: Dcs105

L	T	P	Credits
1	0	4	3

Total Hours: 45

COURSE CONTENT

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 Practical's

1. Introduction to volumetric analysis, apparatus used in volumetric analysis and molarity-based calculations.
2. Preparation of standard solution of oxalic acid $\{(COOH)_2 \cdot 2H_2O\}$ 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 spectrophotometric 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.

Course Title: Applied Physics-I Lab

Course Code: Dcs107

L	T	P	Credits
0	0	2	1

Total Hours: 15

List of Practical's

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

Course Code: Dcs108

L	T	P	Credits
0	0	2	1

Total Hours: 15

List of Practical's

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

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 (Minimum 4 beads on 100mm long 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. (100mm long).

Job V Preparation of T Joint using gas or arc welding (100mm x 6mm M.S. Flat).

2. FITTINGSHOP- I

2.1 Use of personal protective equipment and safety precautions while working.

2.2 Basic deburring 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 Introduction to various fitting shop operations/processes (Hacksawing, Drilling, Chipping and Filing).

Job I Marking of job, use of marking tools, filing and use of measuring instruments. (Vernier caliper, Micrometer and Vernier height gauge).

Job II Filing a rectangular/square piece to maintain dimensions with in an accuracy of 0.25 mm.

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

3. SHEET METAL SHOP-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 hand shears.

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. ELECTRIC SHOP-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 Identification 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 using fuse, switches, sockets, ceiling rose etc. in batten or P.V.C. casing-capping.

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 Making of different types of wooden pin and fixing methods. Marking measuring 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 & Clays in 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

Course Code: DCS110

L	T	P	Credits
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

Course Code: Dcs201

L	T	P	Credits
3	0	0	3

Total Hours: 45

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 Nought Availeth – 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 Kamlesh Sadanand & Susheela Punitha; Published by Orient BlackSwan, Hyderabad
- Practical Course in English Pronunciation by J Sethi, Kamlesh Sadanand & 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

Course Code: Dcs202

L	T	P	Credits
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.

Four standard limits

$$\lim_{x \rightarrow a} \frac{x^n - a^n}{x - a}, \quad \lim_{x \rightarrow 0} \frac{\sin x}{x}, \quad \lim_{x \rightarrow 0} \frac{a^x - 1}{x}, \quad \lim_{x \rightarrow 0} (1+x)^{1/x}$$

Differentiation of x^n , $\sin x$, $\cos x$, $\tan x$, e^x , $\log x$ (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)-

$$\text{Evaluation of } \int_0^{n/2} \sin^n x \cdot dx, \quad \int_0^{n/2} \cos^n x \cdot dx, \quad \int_0^{n/2} \sin^m x \cos^n x \cdot dx$$

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 numerical), Explanation of different sampling techniques (No numerical).

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

Course Code: Dcs203

L	T	P	Credits
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, coefficient 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, Lenz's law and its uses like dynamo, 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: Electrical & Electronics Engineering

Course Code: Dcs213

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 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 and Co., 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 Practical's:

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 Practical's

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 time 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 The Ne semiconductor LASER.
10. Use of CRO in plotting AC/DC

**Course Title: Basic Electrical & Electronics Engineering
Lab**

Course Code: Dcs214

L	T	P	Credits
0	0	2	1

Total Hours: 15

List of Practical's:

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

Course Code: Dcs212

L	T	P	Credits
1	0	4	3

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

Course Code: Dcs211

L	T	P	Credits
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 resistors, 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

10A/C

SEMESTER-III

Course Title: Digital Electronics

Course Code: DCS301

L	T	P	Credits
3	0	0	3

Total Hours: 45

COURSE CONTENTS:

UNIT-I

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/subtractor. Adder and Subtractor IC (7484).

Decoders, Multiplexers and De Multiplexers: 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 latches 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

Course Code: DCS302

L	T	P	Credits
3	0	0	3

Total Hours:45

COURSE CONTENTS:

UNIT-I

8 Hours

Introduction & Programming Fundamentals: Basics: History of C, features of C, and the basic structure of a C program.

Program Development: Understanding algorithms, flowcharts, and the process of compiling and executing programs.

Building Blocks: Character sets, tokens, keywords, identifiers, and constants.

UNIT-II

12 Hours

Variables, Data Types, and Operators

Data Types, Operators: Arithmetic, relational, logical, assignment, increment/decrement, and bitwise operators, I/O Operations: Formatted and unformatted input/output using functions like printf (), scanf (), getchar (), and putchar ()

Control Structures (Branching & Looping)

Decision Making: if, if-else, nested if, and switch statements.

Looping: for, while, and do-while loops for repetitive tasks.

Jump Statements: Use of break, continue, and go to

UNIT-III

12 Hours

Arrays and Strings

Arrays: Declaration, initialization, and processing of one-dimensional and multi-dimensional arrays.

Strings: Character arrays, string handling functions (e.g., strlen, strcpy, strcat), and string input/output

Functions and Modular Programming

Function Basics: Definition, declaration (prototypes), and calling functions.

Parameter Passing: Understanding call by value and call by reference.

Advanced Functions: Recursion (functions calling themselves) and standard library functions

UNIT-IV

13 Hours

Pointers and Memory Management

Pointers: Definition, initialization, and use of * and & operators.

Operations: Pointer arithmetic and using pointers with arrays and functions. **Dynamic Memory:** Basic introduction to memory allocation using malloc(), calloc(), and free()

Structures, Unions, and File Handling

Derived Types: Defining and using structures and unions to handle complex data. **File Management:** Basic operations like opening, closing, reading from, and writing to files.

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: Relational Database Management System

Course Code: DCS304

L	T	P	Credits
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, Database 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

10 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

15Hours

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, maintaining Database Objects, Commit and Rollback, various types of select commands, various types of joins.

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

Course Code: DCS305

L	T	P	Credits
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 William 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: Microprocessors

Course Code: DCS311

L	T	P	Credits
3	0	0	3

Total Hours: 15

COURSE CONTENTS:

UNIT-I

10 Hours

Introduction: Microprocessor as programmable device, memory, input, output, microprocessor as CPU, Organization of microprocessor-based system, working of microprocessor

UNIT-II

10 Hours

Microprocessor Architecture & Microcomputer Systems: Pin diagram of 8085 Microprocessor and architecture, Pin diagram of 8086 Microprocessor and architecture. Addressing mode of Microprocessor. Type of Instruction set. Pin diagram of 8051 Microcontroller and architecture. Processor initiated operations and 8085 BUS Organization, Internal Data operations and 8085 registers

UNIT-III

15 Hours

Operation and Control of Microprocessor: Timing and control unit, op-code fetch machine cycle, memory read/write machine cycles, I/O read/write machine cycles, interrupt acknowledge machine cycle, state transition diagram.

Instruction Set & Assembly Language Programming: Assembler directives, simple examples, Subroutines, parameter. Addressing Modes Immediate: register, direct, indirect, and indexed addressing. Instruction Types: Data transfer, arithmetic, logical, branching, and machine control instructions.

UNIT-IV

10 Hours

Interrupts & Data Transfer: Types of interrupts, masking, and writing Interrupt Service Routines (ISRs). Programmed, interrupt-driven, and Direct Memory Access (DMA).

Transaction Modes

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

Suggested Readings

- Microprocessor Architecture, Programming and Applications with the 8085 by
- Ramesh S. Gaonkar, Penram International Publishing (India) Pvt. Ltd., New Delhi.
- The 8086 Microprocessor: Programming and Interfacing the PC by Kenneth J.
\\
- Ayala, Cengage Learning India Pvt. Ltd., New Delhi.
- Advanced Microprocessors and Peripherals by A. K. Ray and K. M. Bhurchandi,
- Tata McGraw Hill Education Pvt. Ltd., New Delhi.
- Microprocessors and Interfacing by Douglas V. Hall, Tata McGraw Hill Education
- Pvt. Ltd., New Delhi.

Course Title: Digital Electronics Lab

Course Code: DCS306

L	T	P	Credits
0	0	2	1

Total Hours: 15

List of Practical's:

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.

Course Title: Computer Programming Using C Lab

Course Code: DCS307

L	T	P	Credits
0	0	4	2

Total Hours: 30

List of Practical's:

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
Course Code: DCS308

L	T	P	Credits
0	0	4	2

Total Hours: 30

List of Practical's:

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. Diploma CSE
(Batch-2025-2026)

Course Title: Multimedia and Applications Lab
Course Code: DCS309

L	T	P	Credits
0	0	2	1

Total Hours: 15

List of Practical's:

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: Microprocessors Lab

Course Code: DCS312

L	T	P	Credits
0	0	2	1

Total Hours: 15

List of Practical's:

- 1.Introduction of 8085 Microprocessor and Its Trainer kit
2. Performing assembly language Programming of addition, Subtraction, multiplication, division using 8085 Microprocessors
3. To perform sorting of 10 numbers in 8085 microprocessors
4. To find the factorial of a given number and searching the smallest number in a given array in 8085 microprocessors.
5. Find the sum of a series of numbers in 8085 micro processor
6. Design an 8051 μ C based circuit and its associated program to implement 4-bit binary counter using LEDs
8. To write an assembly language program to arrange 3 numbers in descending order by using-8085 microprocessor kit
9. To write an assembly language program to find the summation of series of four 8-bit numbers by using-8085 micro-processor kit.
- 10.To write an assembly language program to multiply two8-bit numbers by using-8085micro-processor kit.

SEMESTER IV

Course Title: Generic Skills and Entrepreneurship Development

Course Code: DCS401

L	T	P	Credits
3	0	0	3

COURSE CONTENTS:

UNIT-I

8 Hours

Basics of Essential Life Skills: Meaning and Importance of Life Skills. self-Awareness and Self-Understanding. Positive Thinking and Attitude. Communication Skills (Basic Level). Types of life skills. Personal strengths and weaknesses

UNIT-II

14 Hours

Personal Growth and Development: Meaning and Importance of Personal Growth. Self-Awareness and Self-Confidence. Positive Thinking and Motivation. Goal Setting and Life Planning. Building Good Habits. Self-Discipline and Responsibility. Life Skills and Personal Development. Personal Effectiveness and Motivation. Personal Leadership and Growth Skills

UNIT-III

9 Hours

Task Management: Meaning and Importance of Time Management Value of Time in Daily Life. Planning and Scheduling. Setting Short-Term and Long-Term Goals. Avoiding Time Waste

Creative Thinking and Decision Making: Meaning and Importance of Creative Thinking. Positive Thinking and Innovation. Types of Thinking. Developing New Ideas. Steps in Decision Making. Personal and Professional Decisions. Simple Decision-Making Techniques. Problem Handling in Daily Life

UNIT-IV

14 Hours

Entrepreneurship Skills Development: Introduction to Entrepreneurship. Qualities of an Entrepreneur. Small Business Ideas. Self-Employment Opportunities. Leadership and Teamwork. Online Business and E-Commerce. Women Entrepreneurship. Rural entrepreneurship. Personality Development. Success Stories of Entrepreneurs

Transaction Modes. Social Entrepreneurship

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.org).
- Lifelong learning in Global Knowledge Economy, Challenge for
- Developing Countries – World Bank Publication

10A/C

Course Title: Data Structure Using C

Course Code: DCS402

L	T	P	Credits
3	0	0	3

Total Hours: 45

COURSE CONTENTS:

UNIT-I

11 Hours

Structure and Arrays: Definition, Applications, Classification of data structures: primitive and non-primitive, Operations on data structures Definition. Arrays, Single dimensional array, two-dimensional array storage strategies of multidimensional arrays,

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.

10AC

Course Title: Object Oriented Programming Using C++

Course Code: DCS403

L	T	P	Credits
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

Course Code: DCS404

L	T	P	Credits
3	0	0	3

Total Hours: 45

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

10A/C

Course Title: Installation, Maintenance And Troubleshooting Of Computer Networks

Course Code: Dcs411

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 Network addresses 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., squid poxy, 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.

10A/C

Course Title: Operating Systems

Course Code: DCS412

L	T	P	Credits
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.

10AC

Course Title: Data Structure Using C Lab

Course Code: DCS407

L	T	P	Credits
0	0	2	1

Total Hours: 15

List of Practical's

1. Write a program to perform insertion and deletion operations in an array.
2. Write a program to perform insertion and deletion operations in a singly linked list.
3. Write a program to perform insertion and deletion operations in a doubly linked list.
4. Write a program to implement a stack using arrays.
5. Write a program to implement a stack using pointers (linked list).
6. Write a program to implement a queue using arrays.
7. Write a program to implement a queue using pointers (linked list).
8. Write a program to perform linear search on a given list.
9. Write a program to perform binary search on a given sorted list.
10. Write a program to implement the Bubble Sort algorithm.
11. Write a program to implement the Tree operations
12. Write a program to implement the Quick Sort algorithm.
13. Write a program to implement the Selection Sort algorithm.
14. Write a program to convert an infix expression into postfix notation.

**Course Title: Object Oriented Programming
Using C++ Lab
Course Code: DCS408**

L	T	P	Credits
0	0	4	2

Total Hours: 30

List of Practical's:

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: Installation, Maintenance
And Troubleshooting Of Computer
Networks Lab**
Course Code: DCS413

L	T	P	Credits
0	0	2	1

Total Hours: 30

List of Practical's

1. Install and configure a computer system and its peripherals according to environmental and site requirements.
2. Perform preventive maintenance of a computer system and prepare a maintenance schedule.
3. Identify and troubleshoot common hardware faults using service manuals and diagnostic tools.
4. Use test and measuring instruments for fault detection and circuit tracing.
5. Install and configure a Network Interface Card (NIC) in a computer.
6. Prepare, crimp, and test UTP straight-through and crossover cables using RJ-45 connectors.
7. Configure TCP/IP settings using both static and dynamic IP addressing.
8. Create and configure a Workgroup and share files and printers over a local area network.
9. Configure and troubleshoot DNS, Gateway, and IP address settings.
10. Install and configure a network router and wireless access point.
11. Configure and manage a network switch, including a manageable switch.
12. Install and troubleshoot LAN cards, hubs, bridges, and switches.

SEMSTER V

Course Title: Basics of Management

Course Code: DCS515

L	T	P	Credits
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).

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.

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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, Labor 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.

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.

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 Shyamal Banerjee: 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 Pvt Limited, Rajouri Garden, New Delhi.

Course Title: Web Designing and Development

Course Code: DCS516

L	T	P	Credits
3	0	0	3

Total Hours: 45

COURSE CONTENTS

UNIT I

13 Hours

Web Design Principles: Basic principles involved in developing a web site. Five Golden rules of web designing. Designing navigation bar. Page design. Home Page Layout. Design Concept

UNIT II

10Hours

Basics in Web Design: Brief History of Internet. What is World Wide Web, Why create a web site. Web Standards. Audience requirement

Introduction to HTML: What is HTML. HTML Documents. Basic structure of an HTML document. Creating an HTML document. Mark up Tags. Heading-Paragraphs. Line Breaks .HTML Tags.

UNIT III

15 Hours

Elements of HTML: Introduction to elements of HTML. Working with Text. Working with Lists, Tables and Frames. Working with Hyperlinks, Images and Multimedia. Working with Forms and controls.

UNIT IV

12 Hours

Introduction to Web Publishing or Hosting: Creating the Web Site. Saving the site. Working on the web site. Creating web site structure. Creating Titles for web pages. Themes-Publishing web sites.

Transaction Modes

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

- *HTML and CSS: The Complete Reference* – Thomas A. Powell, McGraw-Hill Education.

- *Web Design with HTML, CSS, JavaScript and jQuery Set* – Jon Duckett, Wiley.
- *Web Technologies: HTML, CSS, JavaScript, PHP, Java, XML and AJAX* – Achyut S. Godbole & Atul Kahate, McGraw-Hill Education.
- *Sams Teach Yourself HTML, CSS & JavaScript All in One* – Julie Meloni, Pearson. *Learning Web Design* – Jennifer Robbins, O'Reilly

10A/C

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 II

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, TRACEROUT, Wiresharp/ sniffer/ Pcop.

Wireless Networking: Basics of Wireless: Wireless MAN, Networking, Wireless LAN, Wi-Fi, Wi Max (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: Computer Graphics

Course Code: DCS517

L	T	P	Credits
3	0	0	3

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.

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 Sprauell
- 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 Harrin

10AC

Course Title: Web Designing and Development Lab
Course Code: DCS518

L	T	P	Credits
0	0	4	2

Total Hours: 45

List of Practical

1. Write an HTML program to create a basic web page using headings, paragraphs, and line breaks.
2. Write an HTML program to demonstrate text formatting tags such as bold, italic, underline, superscript, and subscript.
3. Write an HTML program to create ordered, unordered, and description lists.
4. Write an HTML program to create a table displaying student details with appropriate rows and columns.
5. Write an HTML program to create hyperlinks for internal pages, external websites, and email addresses.
6. Write an HTML program to insert images and apply image attributes such as width, height, and alternate text.
7. Write an HTML program to display another web page using a frame.
8. Write an HTML program to design a student registration form using various form controls such as text boxes, radio buttons, checkboxes, drop-down lists, and buttons.
9. Write an HTML program to embed audio and video files in a web page using HTML5 multimedia tags.
10. 10HTML program to design a simple home page with a navigation bar, heading, image, and footer.
11. Write an HTML program to create a simple multi-page website consisting of Home, About, Gallery, and Contact pages with proper navigation.
12. Write an HTML program to create a simple website and publish it by organizing web pages in an appropriate folder structure and demonstrating web hosting using a free hosting service or local server.

Course Title: Computer Graphics Lab
Course Code: DCS519

L	T	P	Credits
0	0	2	1

Total Hours: 45

List of Practical

1. Write a program to draw a line using graphics functions.
2. Write a program to draw a rectangle and a square.
3. Write a program to draw a circle and an ellipse.
4. Write a program to draw different basic shapes such as a triangle, polygon, and arc.
5. Write a program to display different colors using graphics functions.
6. Write a program to draw a simple house using basic graphics primitives.
7. Write a program to draw a national flag using graphics functions.
8. Write a program to draw a smiley face using circles, arcs, and lines.
9. Write a program to create a simple scenery (sun, mountains, trees, and river).
10. Write a program to display text at different positions on the graphics screen.
11. Write a program to create a simple animation such as a moving ball or moving car.
12. Write a program to create a simple graphical design using different shapes and colors.

Course Title: Minor Project

Course Code: DCS509

L	T	P	Credits
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

Course Code: DCS510

L	T	P	Credits
-	-	-	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 a detailed report of the observation of process seen by him/her. These students should be supervised and guided by respective subject teachers. Each teacher may guide a group of four 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: Software Engineering

Course Code: DCS520

L	T	P	Credits
3	0	0	3

Total Hours: 45

COURSE CONTENTS:

UNIT I

10 Hours

Introduction to Software Engineering: Software Definition, Software Characteristics, Software Development Life Cycle (SDLC), Software Process Models: Waterfall Model, Prototype Model, Incremental Model, Spiral Model

UNIT II

12 Hours

Requirement Engineering: Requirement Engineering, Requirement Gathering, Feasibility Study, Requirement Analysis, Software Requirement Specification (SRS). Functional Requirements, Non-Functional Requirements, Data Flow Diagram (DFD)

UNIT III

15 Hours

Software Design: Software Design, Design Concepts, Modular Design, Cohesion and Coupling, Architectural Design, Object-Oriented Design (OOD), UML Diagrams

UNIT IV

8

Hours

software Testing: Software Testing, Verification and Validation, Black Box Testing, White Box Testing, Unit Testing, Integration Testing, System Testing, Debugging

Transaction Modes

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

Suggested Readings – Software Engineering

- Software Engineering: A Practitioner's Approach – Roger S. Pressman & Bruce R. Maxim, McGraw Hill Education.
- Software Engineering – Ian Sommerville, Pearson Education.
- Software Engineering: Principles and Practice – Hans Van Vliet, Wiley.
- Software Engineering: Modern Approaches – Roger S. Pressman,

McGraw Hill Education.

- An Integrated Approach to Software Engineering – Pankaj Jalote, Narosa Publishing House.
- Software Engineering: Concepts and Practice – K. K. Aggarwal & Yogesh Singh, New Age International Publishers.

10AC

Course Title: Network Security

Course Code: DCS520

L	T	P	Credits
3	0	0	3

Total Hours: 45

COURSE CONTENTS:

UNIT I

10 Hours

Introduction to Network Security: Basics of computer networks, Security goals: Confidentiality, Integrity, Availability (CIA), Types of cyber threats and attacks, Security policies and risk management

UNIT II

12 Hours

Cryptography: Meaning and importance of cryptography, Goals of cryptography, Concept of secret key encryption, Encryption and decryption, Advantages and disadvantages, public key and private key concept, difference between symmetric and asymmetric encryption

UNIT III

15 Hours

Firewalls: Firewall concepts, Types of firewalls, Functions of Firewall, Advantages of Firewall, Limitations of Firewall, Firewall Architecture

UNIT IV

8 Hours

Network Attacks and Protection: Common network attacks: DoS and DDoS attacks, Man-in-the-Middle attack, Spoofing, Sniffing.

Wireless network security: WEP, WPA/WPA2/WPA3. Web security: SQL Injection, Cross-Site Scripting

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: Principles and Practice – William Stallings, Pearson.
- Network Security Essentials: Applications and Standards – William Stallings, Pearson.

- Computer Security: Principles and Practice – William Stallings & Lawrie Brown, Pearson.
- Network Security: Private Communication in a Public World – Charlie Kaufman, Radia Perlman & Mike Speicher, Pearson.
- Computer Networks – Andrew S. Tanenbaum & David J. Wetherell, Pearson.
- Network Security Bible – Eric Cole, Wiley.

10A/C

Course Title: Internet of Things (IOT)

Course Code: DCS612

L	T	P	Credits
3	0	0	3

Total Hours: 45

COURSE CONTENTS:

UNIT I

10 Hours

Introduction to Internet of Thing: Introduction to Internet of Things (IoT) History and Evolution of IoT. Characteristics and Features of IoT. Applications of IoT. Advantages and Challenges of IoT. Components of IoT. IoT Architecture IoT Communication Model's

UNIT II

12 Hours

IoT Devices and Sensors: Introduction to Arduino. Digital and Analog Pins. LED and Push Button. Buzzer. Temperature Sensor. LDR Sensor Ultrasonic Sensor

UNIT III

15 Hours

IoT Communication: Basic of Networking. Wi-Fi and Bluetooth. IoT Communication Introduction to Cloud Data. Collection and Monitoring. IoT Security Basics

UNIT IV

8 Hours

IoT Applications: Smart Home. Smart Agriculture. Smart Healthcare. Smart City. Industrial IoT Introduction to Blynk and Thing Speak. Simple IoT 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

- Internet of Things: A Hands-on Approach – Arshdeep Bahga & Vijay
- Marinetti, Universities Press.
- Internet of Things – Raj Kamal, McGraw Hill Education.
- Getting Started with Arduino – Massimo Banzi, Maker Media.
- Programming Arduino: Getting Started with Sketches – Simon Monk, McGraw Hill Education.
- Designing the Internet of Things – Adrian McEwen & Hakim Cassimally, Wiley.

Course Title: Computer Programing Using Python

Course Code: DCS614

L	T	P	Credits
3	0	0	3

Total Hours: 45

COURSE CONTENTS:

UNIT I

12Hours

Introduction to Python and installation, data types: Int, float, Boolean, string, and list; variables, expressions, statements, precedence of operators, comments; modules, functions--- function and its use, flow of execution, parameters and arguments.

UNIT II

10 Hours

Control Flow, Loops Conditionals: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else); Iteration: while, for, break, continue.

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

UNIT III

13Hours

Lists, Tuples, Dictionaries Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters, list comprehension; Tuples: tuple assignment, tuple as return value, tuple comprehension; Dictionaries: operations and methods, comprehension;

UNIT IV

10Hours

Files, Exceptions, Modules, Packages Files and Exception: text files, reading and writing files, command line arguments, errors and exceptions, handling exceptions, modules (datetime, time, OS, calendar, math module), Explore packages.

Transaction Modes

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

- Allen B. Downey, ``Think Python: How to Think Like a Computer Scientist “, 2nd edition, Updated for Python 3, Shroff/O’Reilly Publishers, 2016.
- 2.R. Nageswara Rao, “Core Python Programming”, dreamtech
- Python Programming: A Modern Approach, Vamsi Kurama, Pearson

Course Title: Java Programming
Course Code: DCS615

L	T	P	Credits
3	0	0	3

Total Hours: 45

COURSE CONTENTS:

UNIT I

12Hours

Fundamentals to Java: Introduction to Java. History and Features of Java. Applications of Java C++. Structure of Java Program. Writing and Executing Java Programs. Variables and Data Types. Operators in Java. Input and Output Statements

UNIT II

10 Hours

Java Classes and Memory Management: Introduction to OOP Concepts. Classes and Objects. Constructors. Inheritance. Polymorphism. Encapsulation. Abstraction
Introduction to Java Memory Management. JVM Memory Structure. Automatic Memory Management. Object Creation and Memory Allocation.

UNIT III

13Hours

Control Statements and Methods: Decision Making Statements. if Statement. if-else Statement. switch Statement. Looping Statements: for Loop. while Loop. do-while Loop. Break and Continue Statements

UNIT IV

10Hours

Threads and Multi-threading: Introduction to Threads. Process and Thread Difference. Advantages of Threads. Life Cycle of a Thread. Thread States. Creating Threads in Java. Using Thread Class

Introduction to Applet, Application and JDK: Introduction to Applets. Features of Applets. Applet Life Cycle: init () start () paint () stop () destroy (). introduction to JDK. Components of JDK

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.

10AC

COURSE Title: Computer Programing Using Python Lab

Course Code: DCS616

L	T	P	Credits
0	0	4	2

Total Hours: 15

COURSE CONTENTS:

List of Practical's:

1. Write a Python program to display "Hello World" message.
2. Write a Python program to perform basic arithmetic operations (addition, subtraction, multiplication, and division).
3. Write a Python program to find the largest among three numbers.
4. Write a Python program to check whether a number is even or odd.
5. Write a Python program to check whether a number is positive, negative, or zero.
6. Write a Python program to generate a multiplication table of a given number.
7. Write a Python program to find the factorial of a number.
8. Write a Python program to generate Fibonacci series.
9. Write a Python program to perform operations on a list (create, add, remove, and display elements).
10. Write a Python program to count vowels in a string.
11. Write a Python program to create and use functions.
12. Write a Python program to read and write data in a file.
13. Write a Python program to create a class and object.
14. Write a Python program to handle exceptions using try and except.
15. Write a simple Python mini project (Calculator, Student Record System, or Number Guessing Game).

Course Title: Java Programing Lab
Course Code: Dcs617

L	T	P	Credits
0	0	4	2

Total Hours: 15

COURSE CONTENTS:

List of Practical's:

1. Write a Java program to print "Hello World".
2. Write a Java program to add two numbers.
3. Write a Java program to perform arithmetic operations.
4. Write a Java program to check whether a number is even or odd.
5. Write a Java program to find the largest of two numbers.
6. Write a Java program to calculate the area of a circle.
7. Write a Java program to display a multiplication table.
8. Write a Java program to find the factorial of a number.
9. Write a Java program to generate Fibonacci series.
10. Write a Java program to check whether a number is prime or not.
11. Write a Java program to create a class and object.
12. Write a Java program to demonstrate inheritance

Course Title: Major Project

Course Code: Dcs607

L	T	P	Credits
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: Big Data

Course Code: Dcs618

L	T	P	Credits
3	0	0	3

Total Hours: 45

COURSE CONTENTS:

UNIT I

12Hours

Fundamentals of Big Data: Introduction to Big Data, Need and importance of Big Data, Characteristics of Big Data, Types of Data, Applications of Big Data, Challenges of Big Data, Difference between Traditional Data and Big Data.

Machine Learning, Cloud and Security: Introduction to Machine Learning, Types of Machine Learning, Cloud Computing Basics, Big Data on Cloud Platforms, Difference between Big Data, and machine Learning

UNIT II

10 Hours

Data Processing and Storage: Introduction to Data Processing, Batch Processing and Real-Time Processing. Introduction to Apache Spark, Spark Architecture, Spark Components. Data Storage Methods, Types of NoSQL Databases

UNIT III

13Hours

Big Data Technologies and Hadoop: Introduction to Hadoop, Features of Hadoop, Hadoop Architecture, Hadoop Ecosystem Components, Name Node and Data Node, Advantages and limitations of Hadoop.

UNIT IV

10Hours

Big Data Analytics Using Tools: Introduction to Data Analytics, Data Collection Methods, Data Cleaning and Data Transformation, Data Analysis Process, Introduction to Python for Big Data, Data Visualization Concepts.

Transaction Modes

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

Suggested Readings

- Hadoop: The Definitive Guide by Tom White; O'Reilly Media.
- Big Data Analytics: A Hands-On Approach by Seema Acharya and Subhashini Chaliapin; Wiley Publication.

- Big Data: Concepts, Technology and Architecture by David Loshin; Morgan Kaufmann Publication.
- Spark: The Definitive Guide by Bill Chambers and Matei Zaharia; O'Reilly Media.
- Python for Data Analysis by Wes McKinney; O'Reilly Med

10AC

Course Title: Natural Language Processing
Course Code: Dcs619

L	T	P	Credits
3	0	0	3

Total Hours: 45

COURSE CONTENTS:

UNIT I

12Hours

Introduction to Natural Language Processing: Introduction to NLP, Meaning and importance of NLP, Applications of NLP, Natural Language and Human Communication, Challenges in NLP, Difference between Natural Language and Computer Language

UNIT II

10 Hours

Text Processing and Language Basics: Introduction to Text Processing, Text Cleaning and Pre-processing, Parts of Speech (POS) Tagging, Sentence Segmentation, Basic Text Representation.

UNIT III

13Hours

NLP Techniques and Models: Bag of Words (BoW) Model, Term Frequency (TF), N-gram Models, Language Models, TF-IDF Technique.

Machine Learning in NLP: Introduction to Machine Learning for NLP, Supervised Learning in NLP, Unsupervised Learning in NLP, Text Classification, Sentiment Analysis, Named Entity Recognition (NER), Introduction to Deep Learning in NLP.

UNIT IV

10Hours

Advanced NLP Applications: Machine Translation, Speech Recognition, Question Answering Systems, Text Summarization, Information Retrieval

Transaction Modes

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

Suggested Readings

● Speech and Language Processing by Daniel Jurafsky and James H. Martin; Pearson Education.

- Natural Language Processing with Python by Steven Bird, Ewan Klein and Edward Loper; O'Reilly Media.
- Foundations of Statistical Natural Language Processing by Christopher D. Manning and Hinrich Schütze; MIT Press.
- Natural Language Processing: Concepts, Techniques and Applications by T. Siddiqui and U.S. Tiwary; Oxford University Press.
- Introduction to Natural Language Processing by Jacob Eisenstein; MIT Press