DEA- 101 [APPLIED PHYSICS]

UNIT 1

UNITS & MEASUREMENT: Fundamental and derived units. Scalar and vector, Basic requirements to represent vector.Symbols, abbreviation, and proculation.Linear measurement by vernier calipers, screw gauge and spherometer.Angular measurement by angular vernier.

UNIT 2

MOTION: Motion and its type. Linear motion (laws and equation).Circular motion.Angular velocity and relation with linear velocity.Centripetal acceleration, Centripetal and Centrifugal forces.Rotatory motion. Moment of Inertia.Kinetic energy of rotation.

UNIT 3

MOLECULAR PHENOMENON OF SOLIDS, LIQUIDS AND GASES: Postulates Of Molecular Kinetic theory of Structure of matter. Brownian motion .Kinetic and Potential energy of molecules. Prove of different gases law by Kinetic theory.

UNIT 4

PROPERTIES OF MATTER: Elasticity: Meaning, definition, stress, strain, Hook's law and elastic limit. Surface Tension: Meaning, definition, molecular forces, cohesive and adhesive forces, surface energy, capillary rise and capillary rise method. Viscosity, stream line and turbulent flow.

UNIT 5

MODERN PHYSICS: Photoelectric effect, threshold frequency, Einstein- equation, Photo electric cells. Radioactivity: decay constant, Half-life, mean life. Properties of nucleus, nuclear mass, mass defect. Production of x-rays, properties and its uses. Conductor, semiconductor and insulators on the basis of band theory. P-N junction, diode as rectifier.

LIST OF EXPERIMENTS:

(1) PN Junction Diode Characteristics
(2) Zener Diode Characteristics
(3) Verification of ohm's Law
(4) Young's Modulus by Searl's Method
(5) Surface Tension by Capillary Rise Method
(6) Moment of Inertia of Flywheel
(7) Focal Length of Convex Lens by Displacement Method
(8) Refractive Index of Prism by Spectrometer
(9) To measure thickness of given sheet using Screw guage
(10) To measure diameter of a small spherical /cylindrical body using VernierCallipers.

REFERENCE BOOKS:

1. Applied Physics Vol. 1 & 2 by Saxena and Prabhakar
2. Physics TTTI Publication
3. Modern Physics by Satya Prakash
4. Engineering Physics by Gour And Gupta
5. Principle of Physics by BrijLal & Subramanyam
6. Nuclear Physics by D.C. Tayal. 7. Physics by Ajay Ghatak

DEA- 102 [APPLIED CHEMISTRY]

UNIT 1

ATOMIC STRUCTURE AND RADIOACTIVITY: Discovery of electron, proton ,neutron and nucleus. Ruther ford's and Bohr's model of an atom. Alfa, Gamma and Beta rays, theory of radio activity, Group displacement law, half life period, fission and fusion.

CHEMICAL BONDING AND CATALYSIS: Bonding: Nature of bonds- Electrovalent, Co-valent, co-ordinate and hydrogen bond.Catalysis : Types and characteristic. Catalytic promoter and inhibitors.Industrial Application of catalysis.

UNIT 2

SURFACE CHEMISTRY AND ITS APPLICATION: True solution, colloidal solution and suspension, lyophobic and lyophillic colloids, optical and electrical properties of colloids, coagulation, coagulants, idea about gels and emulsions.

ELECTROCHEMISTRY: Electrolysis, Faraday's laws of electrolysis, electroplating of copper and nickel.

COLLIGATIVE PRPOPERTIES: Osmosis & osmatic pressure, Relative vapour pressure and Routls law. Enthalpy and Entrophy.

UNIT 3

WATER: Sources of water, types of water, hardness of water, its causes, types and removal, Boiler feed water, harmful - effects of hard water in boiler. Municipal water supply.soda lime process. EDTA.

IONIZATION, PH VALUE CORROSION AND PROTECTION: Arhenius theory of ionization, factors affecting ionization. Buffer solutions. Corrosion and its types, factors effecting corrosion, corrosion control.

UNIT 4

METALS AND ALLOYS: Physical and chemical properties, General principal of metallurgy, minerals/ores, Explanation of alloying purposes, methods of alloying, composition and uses of alloy.

GLASS, CEMENT AND REFRACTORY: Composition and manufacture of glass, varieties of glass and annealing of glass,

Cement : Composition of Portland Cement, its manufacture, setting and hardening of cement. Refractories: Meaning, characteristics, use of common refractorymaterials.

UNIT 5

LUBRICANTS, PAINTS AND VARNISHES: Lubricants: Meaning , type and theory of lubricants, properties of a good lubricants, Flash and fire point and cloud point, emulsification number, viscosity.

Paints and Varnishes: Meaning, ingredients and characteristics of good paintsand varnishes, their engineering applications.

LIST OF EXPERIMENTS:

1. Determination of viscosity by Red Wood Viscometer no. 1
2. Determination of viscosity by Red Wood Viscometer no. 2.
3. To identify one Anion and Cation in a given sample.
4. Determination of flesh point and fire point of a given sample of oil by PenskyMartins's apparatus.
5. Determination of flesh point and fire point of a given sample of oil by Cleanland's Open Cup apparatus.
6. Determination of Hardness of Water by EDTA Method.
7. Determination of pH Values of Given Samples.
8. Determination of hardness of water by : EDTA Method
9. Determination of hardness of water by : Soap Solution Method.
10. Determination of Percentage Purity of an Acid by Titration with standard Acid.
11. Determination of the Strength of Copper Sulphate Solution using a Standard Solution of thioSulphate.
12. Estimation of Free Chlorine in Water.

REFERENCE BOOKS:

1. Physical Chemistry - Bahl and Tuli
2. Inorganic Chemistry - Satyaprakash
3. Modern Text Book Of .Applied Chemistry - Dr. G. C. Saxena, Jain Prakashan, Indore
4. Applied Chemistry - Dr. G. C. Saxena, Deepak Prakashan,Gwalior
5. Applied Chemistry - Shrivastava&Singhal, Pbs Publication, Bhopal.
6. Engineering Chemistry – Uppal
7. Engineering Chemistry - Rao .And Agarwal
8. Engineering Chemistry - P.C. Jain
9. Polymer Chemistry - O.P. Mishra
10. Applied Chemistry - H.N. Sahni, Deepak Prakash

DEA-103 [COMMUNICATION SKILLS]

UNIT 1

BASICS OF COMMUNICATION: Introduction, meaning and definition, process of communication etc. Types of communication: formal and informal, verbal, non-verbal and written Barriers to effective communication.

7 Cs for effective communication (considerate, concrete, concise, clear, complete, correct, courteous). Art of Effective communication, Choosing words, Voice ,Modulation ,Clarity ,Time, Simplification of words, Technical Communication.

UNIT 2

PASSAGES OF COMPREHENSION: Language of Science, Desalination or Desalting Process, Safety Practices, Non-conventional Sources of Energy, Our Environment, Entrepreneurship. Writing summary, moral and characterization of any one story from the book prescribed.

UNIT 3

SOFT SKILLS FOR PROFESSIONAL EXCELLENCE

Introduction: Soft Skills and Hard Skills, Importance of soft skills.

Life skills: Self-awareness and Self-analysis, adaptability, resilience, emotional intelligence and empathy etc.

Applying soft skills across cultures. Case Studies.

UNIT 4

PROFESSIONAL WRITING

The art of précis writing,

Letters: business and personnel,

Drafting e-mail, notices, minutes of a meeting etc.

Filling-up different forms such as banks and on-line forms for placement etc.

UNIT 5

VOCABULARY AND GRAMMAR Vocabulary of commonly used words ,Glossary of administrative terms (English and Hindi)One-word substitution, Idioms and phrases etc. Parts of speech, active and passive voice, tenses etc., Punctuation.

REFERENCE BOOKS:

1. English Conversation Practice - Grant Taylor
2. Practical English Grammar - Thomson & Martinet
3. Communication Skills for Technical Students Book -1, Book - II by M/S Somaiya Publication, Bombay
4. Living English Structure - S. Allen
5. English Grammar, Usage, and Composition - Tickoo& Subramanian, S. Chand & Co.

Standard Allen Longman.
6. Essentials of Business Communication - Dr. Rajendra Pal & J.S. Korlahalli, S.Chand& Sons, New Delhi.
7. Effective Business Communication - M.V. Rodriques, Concept Pub. Co., New Delhi.
8. Communication for Business - Shirely Taylor, Longman, England.
9. Oxford Dictionary
10. Technical English Book-II, Somaya Publications, New Delhi

DEA-104 [ENVIRONMENTAL SCIENCE.]

UNIT - 1

Introduction To Environment:- The Biosphere **,** Biotic and Abiotic Ecosystem, Pollution Impact of Environment on Human Being , Basic Approach to Improve Environmental Qualities , Roll of An Environmental Engineer. Sources of Energy , Renewable & Non Renewable, Fossil fuel, Biomass Geothermal, Hydrogen, Solar, Wind, hydra, Nuclear Sources.

UNIT –2

Air Pollution :- Air Pollution: Air pollutants, Green house Effect, Ozone Layer Depletion, Acid Rain, Global warming.**Noise Pollution**: Introduction , Controlling Measures, Measurement of Sound Pollution (deciblage), Classification of Noise pollution(Transport Noise, Industrial Noise, Neighborhood Noise).

UNIT –3

Water Pollution:– Water Pollution: Pollutants in water, Treatment of water, Major Water Compartments, Quality Standard Of Water, Soil Pollution – Soil Profile, Thermal & Radio Active pollution.

UNIT:-4

Solid Waste Management :- Urban Waste Management, Incinerators, Industrial Waste Management, Biomedical Wastes& its control, Waste Minimization Techniques.

UNIT –5

Ethics & Safety :– Professional Ethics, Impact of waste on society, Ethics and moral values, ethical Theories, Fire Hazards Prevention, Industrial Hazards Prevention, Protection From Air and Noise Pollution.

REFERENCE BOOKS:

1. Environmental pollution control Engineering by C. S. Rao
2. Air pollution and control by Seth
3. Air pollution by M.N Rao
4. Industrial waste and its treatment by Seth
5. Paryavaran Yantri i Hindi granthakadami
6. Principles of Energy Environment, Ethics and Society by Raman Sivakumar

DEA-105 [MATHEMATICS –I]

UNIT - I

TRIGONOMETRY :Concept of angles, measurement of angles in degrees, grades and radians and their conversions,T-Ratios of Allied angles (without proof), Sum, difference formulae and their applications (withoutproof). 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 .

UNIT – II

DIFFERENTIAL CALCULUS : Definition of function; Concept of limits. Four standard limits and . Differentiation by definition of , ex and . Differentiation of sum, product and quotient of functions. Differentiation of function of a function. Differentiation of trigonometric and inverse trigonometric functions, Logarithmic differentiation, Exponential functions.

UNIT - III

ALGEBRA Complex Numbers: Definition, real and imaginary parts of a Complex number, polar and Cartesian,representation of a complex number and its conversion from one form to other, conjugate of a complexnumber, modulus and amplitude of a complex number Addition, Subtraction, Multiplication and Division of a complex number. De-movier's theorem, its application.

UNIT - IV

PARTIAL FRACTIONS: Definition of polynomial fraction proper & improper fractions and definition of partial fractions. To resolve proper fraction into partial fraction with denominator containingnon-repeated linear factors, repeated linear factors and irreducible non-repeated quadratic factors.To resolve improper fraction into partial fraction.

UNIT - V

PERMUTATIONS AND COMBINATIONS: Value of nPr and nCr. Binomial theorem: 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

REFERENCE BOOKS:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, New Delhi, 40th Edition, 2007.
2. G. B. Thomas, R. L. Finney, Calculus and Analytic Geometry, Addison Wesley, 9th Edition, 1995.
3. Reena Garg, Engineering Mathematics, Khanna Publishing House, New Delhi (Revised Ed. 2018)
4. V. Sundaram, R. Balasubramanian, K.A. Lakshminarayanan, Engineering Mathematics, 6/e., Vi

DEA-106 [ENGINEERING WORKSHOP PRACTICE]

LIST OF EXPERIMENTS:

Prepare a list of general safety Rules to be followed in Workshop and sketch the detailed drawing of workshop and measuring devices.

Carpentry

1. Sketch & Label Details of Carpentry shop Layout.
2. Sketch and study tools used in carpentry.
3. To make a T lap joint.
4. To make a cross lap joint.

Black smithy

1. Sketch & Label Details of smithy shop Layout.
2. Study tools and raw material used in smithy shop.
3. To make an S-hook from a given round rod, by following hand forging operation.
4. To make a J-hook from a given round rod, by following hand forging operation.

Plumbing

1. Demonstration and Study tools and raw material used in plumbing shop

Fitting shop

1 Sketch & Label Details of Fitting shop Layout.
2 Sketch and study tools used and drilling machine in Fitting shop.
3 To make a Square fit from the given mid steel pieces .
4 To make a V-Fit from the given mid steel pieces.

Welding

1 Sketch & Label Details of welding shop Layout.
2 Study tools and raw material used in welding shop.
3 To make a Butt joint using the given two M.S pieces by arc welding.
4 To make a lap joint using the given two M.S pieces by arc welding.

Note :- Any one job should be prepared in each shop.

DEA-201 [BASIC ELECTRICAL & ELECTRONICS ENGINEERING]

UNIT1

Overview of Electronic Components & Signals: Passive Active Components: Resistances, Capacitors, Inductors, Diodes, Transistors, FET, MOS and CMOS and their Applications. Signals: DC/AC, voltage/current, periodic/non-periodic signals, average, rms, peak values, different types of signal waveforms, Ideal/non-ideal voltage/current sources, independent/dependent voltage current sources.

UNIT 2

Electric Current and Ohm's Law. Review of numerical based on series and parallel combination of resistor, capacitor and inductor. Review of numerical on current divison ,voltage division rule. Work, Power and Energy, Heating effect of Electric Current & Joule's Law of Electric Heating.

UNIT 3

Network Theorems (for DC circuits). Concept of Passive, Active, Unilateral & bilateral circuit. Kirchhoff's Laws, Maxwell's Loop Current (Mesh) Analysis, Nodal Analysis, Voltage source, Current source, source transformation. THEOREMS: Superposition, Thevenin's, Norton, Maximum Power Transfer, & Millman Theorem. Star/ Delta & Delta/ Star Transformations.

UNIT 4

ELECTROSTATICS: Static Electricity, Absolute & Relative Permittivity of a Medium, Coulombs Laws of electrostatics, Electric Field, Electrostatic induction, Electric Flux, Electric flux Density, electric potential & energy, potential Difference, Breakdown voltage & dielectric strength. CAPACITANCE: Capacitor, Capacitance, parallel plate capacitor, multiplate capacitor, Cylindrical Capacitor, Capacitors in series & parallel, Energy stored in a capacitor, charging & discharging of a capacitor.

UNIT 5

MAGNETISM Absolute and Relative Permeabilities of a Medium, Laws of Magnetic Force, Magnetic field strength, Flux & Flux Density.

ELECTROMAGNETISM: Oersted experiment, magnetic field, magnetic flux, magnetic flux density, Biot-Savart law, Magnetic circuit & related definitions, Composite Magnetic circuit, Problems based on calculation of Ampere Turns. Electric & Magnetic circuit comparison. Electromagnetic Induction, Production of induced emf and current, Faraday's Laws of Electromagnetic Induction, Lenz's Law, Flemings left hand and right hand rule magnetic hysteresis, Comparison of motor and generator

LIST OF EXPERIMENTS:

1) Verification of Kirchhoff's Current & Voltage Laws.
2) Study of Superposition Theorem.
3) Study of Thevenin's Theorem.
4) Study of Norton's Theorem

5) Study of Maximum Power Transfer Theorem.
6) Transient Response of RC charging & discharging circuits.

TEXT BOOK:

1. A text book of Electrical Technology Volume - I , 2005 Edition, by B L Theraja, A K Theraja, S Chand and Company Limited.
2. Electrical Technology, 8th Edition by Edward Hughes, , Pearson Education.
3. Circuits & Networks 4th Edition by Sudhakar & Shyammohan, (Tata McGraw - Hill Publishing Company Limited).
4. Engineering Circuit Analysis 6th Edition by William H. Hayt, Jr. & Jack E. Kemmerly, (Tata McGraw - Hill Publishing Company Limited)

DEA -202 [APPLIED MECHANICS]

UNIT 1

COMPOSITION AND RESOLUTION OF FORCES: Definition, Effect, characteristics of force. System of Forces. Law of- Parallelogram of Forces, Triangle of Forces, Polygon of Forces.

PARALLEL FORCES AND COUPLES: Classification of Parallel Forces. Methods of finding resultant Force of parallel forces- analytically &graphically. Position of resultant force ofparallel forces.

EQUILIBRIUM OF FORCES: Equilibrium of a system of concurrent forces. Conditions and types of Equilibrium. Lami's Theorem and its applications.

UNIT 2

MOMENTS AND THEIR APPLICATIONS: Definition, Classification and characteristics of a force Couple, moment of couple. Types and law of moment. Varignon's Principle of moment and its applications. Lever and its Applications. Types of supports and determination of support reactions of a simply supported beam subjected to point load and uniformly distributed load (UDL).

CENTRE OF GRAVITY: Difference between Centroid and Center of Gravity (CG). Centroid of standard plane figures and CG of simple solid bodies. Method of finding out Centroid of composite plane laminas and cut sections. Method of finding out CG of Composite solid bodies.

UNIT 3

FRICTION: Limiting Friction, coefficient of friction, angle of friction, angle of repose. Laws of friction (Static and Kinetic). Analysis of equilibrium of Bodies resting on Horizontal and inclined Plane.

SIMPLE LIFTING MECHINES: Mechanical Advantage, Velocity Ratio and Efficiency of Machines and their relation. Self locking machine. Law of Machines, Maximum mechanical advantage and maximum efficiency of machine. Friction in machine (In terms of Load and effort). Simple screw jack

UNIT 4

LAWS OF MOTION: Newton's Laws of motion and their applications. Motion of a particle: Speed, velocity, acceleration, uniform velocity, uniform acceleration and variable acceleration. Motion under constant acceleration / retardation (equations of motion). Motion under force of gravity. Relative velocity. Projectile, velocity of projection, angle of projection, angular velocity, angular acceleration and angular displacement. Relation between linear and angular velocity.

UNIT 5

WORK, POWER AND ENERGY: Definition unit and graphical representation of work. Definition and unit of power and types of engine power and efficiency of an engine. Definition and concept of Impulse. Definition, unit and types of energies. Total energy of a body falling under gravity.

LIST OF EXPERIMENTS:

1. Verification of laws of polygon of forces
2. To determine the moment of inertia of a flywheel.
3. Determination of gravitational force experiment with help of simple pendulum
4. Determination of gravitational force experiment with help of bar pendulum
5. Determination of coefficient of friction for surfaces of different materials on horizontal Plane
6. Determination of coefficient of friction for surfaces of different materials on an inclined plane
7. To verify law of moments using bell crank lever.
8. Verification of laws of parallelogram of forces.
9. Determination of forces in the members of Jib Crane
10. Determination of Centroid of plane lamina by graphical method
11. Determination of mechanical advantage, velocity ratio and efficiency of the Following lifting machines: Simple wheel and axle Differential wheel axle Single purchase crab Double purchase crab Simple pulley block Simple screw jack
12. Measurement of B.H.P. of an engine using rope break dynamometer

REFERENCE BOOKS:

1. A text book of Applied Mechanics - R.S. Khurmi, S.C. Chand & Co. , New Delhi
2. Applied Mechanics - I.B. Prasad, Khanna Publishers, New Delhi
3. Applied Mechanics (Hindi) - R.S. Jog, Anand Publishers, Gwalior
4. Applied Mechanics (Hindi) - A.R. Page, Deepak Prakashan, Gwalior

DEA - 203 [BASIC COMPUTER ENGINEERING]

UNIT 1

INTRODUCTION TO COMPUTERS: Basic Concepts, Generations of Computers, Overview of computer Systems, Classifications of Computers, Characteristics of Computes, Applications of Computers. Numbers System & Codes. Computer Hardware. Input Devices, Output Devices, Storage Devices, Microprocessor, Memory Concepts, Computer Software, Application of Software, Multimedia

Basic Internet skills: Understanding browser, efficient use of search engines, awareness about Digital India portals (state and national portals) and college portals.

UNIT 2

OPERATING SYSTEM: Overview Windows Operating System, Introduction to Linux.

WORD PROCESSING**:** Saving, Closing, Opening of documents Selecting text Editing text Finding and replacing text\Printing documents Merge Documents Character and paragraph Formatting Page Design and layout Spell Check Creating Tables and Charts. Handling Graphics

UNIT 3

SPREADSHEET PACKAGE: Spreadsheet concept - Need, advantage, Terminology like cell, row,column etc. Working with Spreadsheet (Creating, Saving, Editing and printing Entering data - Entering number, text, date, time etc. Selecting cells - Cut, copy, paste date Editing Worksheet data Formatting - Text and Cells, Applying border shading, background patterns, conditional formats, positioning cells, formatting numbers, text, Date, time. Creating formulas- Entering, Editing, Using Functions, Controlling calculations.) Working with Charts- Creating charts, Adding & changing text, changing the view and display, types of charts.

PRESENTATION SOFTWARE: Introduction Presentation design tools Presentation terminologies Creating, Opening and Saving Presentation Working with different views Creating and Organizing slides Adding and Formatting text in slides Formatting paragraphs Adding drawings and objects Creating special effects Working with table and charts Printing Presentation.

UNIT 4

DATABASE: Introduction - need, Characteristics and terminologies of database, Types of database - relational, Hierarchical and Network, Basic entities - Tables, records, Data types, Data Validation and constraints, keys relation between tables. Query - Select, Insert, Update, Delete. Forms - Creating forms, Forms controls Report Designer- Customize formats, grouping reports.

UNIT 5

COMPUTER COMMUNICATION & NETWORKS: Information Networks, The Technology of Workgroup Computing, Types of network, Network topology, Network components, Data Communication, Introduction to Data Communication, Types of Data, Transmission media, Internet and E-mail, Internet Basics, Websites- Applications, terminologies, naming conventions. Web Browsers- Types, Navigation and tools. E-mail - concept, terminologies, mailing services, provider, advantages comparison with Conventional mailing. Search engine - concept, search engine websites, searching methods.

LIST OF EXPERIMENTS:

1. Study of various components of computer like CPU, keyboard, mouse, monitor, printer, CVT and storage devices..
2. Using Windows operating system, study of desktop, control panel, accessories and settings.
3. File management in windows explorer, Study of WordPad, Note Pad, Paint Brush, Calculator etc. Study of Linux operating system.
4. Study of MS-word - opening and saving of documents, formatting, editing and spell check, find and replace, printing, merging. Creating Table, Charts andGraphics.
5. Study of Spreadsheet - creating, saving, editing and printing. Entering data, selecting cells, formatting text.
6. Applying border shades and backgrounds, creating formulas, creating charts.
7. Study of Power Point - creating, opening, editing and saving of slides. Adding and formatting text, creating animations, working with images and special effects. Printing presentation.
8. Study of MS Access- creating, saving, editing and printing of tables. Managing relationships, writing queries e.g. SELECT, UPDATE, DELETE, INSERT. Forms designing and report printing.
9. Study of Web Browser and mailing programs.

REFERENCE BOOKS:

1. S .Jaiswal, A First Course in Computers, Golgotha Publication
2. Slotnick, Butterfield, Colantonio and Kopetzky, Computers & Application, C.C. Health & Company.
3. Suresh K. Basandra, Computers Today, Galgotia Publication
4. Ron Mansfield, the Complete Guide to Microsoft Office Professional, Sybex /BPB Asian Edition
5. Norton Peter, Inside IBM PC.
6. Hardware Bible, BPB Publication

DEA - 204 [MATHEMATICS –II]

UNIT - I

DETERMINANTS AND MATRICES

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

UNIT - II

INTEGRAL CALCULUS

Integration as inverse operation of differentiation. Simple integration by substitution, by parts and by partial fractions (for linear factors only).Applications of integration for

i. Simple problem on evaluation of area bounded by a curve and axes.

ii. Calculation of Volume of a solid formed by revolution of an area about axes. (Simple problems).

UNIT - III

CO-ORDINATE GEOMETRY

Equation of straight line in various standard forms (without proof), inter section of two straight lines, angle between two lines. Parallel and perpendicular lines, perpendicular distance formula. General equation of a circle and its characteristics. To find the equation of a circle, given:

i. Centre and radius,

ii. Three points lying on it and

iii. Coordinates of end points of a diameter;

Definition of conics (Parabola, Ellipse, Hyperbola) their standard equations without proof. Problemson conics when their foci, directories or vertices are given.

UNIT - IV

VECTOR ALGEBRA

Definition notation and rectangular resolution of a vector. Addition and subtraction of vectors. Scalar and vector products of 2 vectors. Simple problems related to work, moment and angular velocity.

UNIT-V

DIFFERENTIAL EQUATIONS

Solution of first order and first degree differential equation by variable separation method (simple problems). MATLAB – Simple Introduction.

References:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, New Delhi, 40th Edition, 2007.

2. G. B. Thomas, R. L. Finney, Calculus and Analytic Geometry, Addison Wesley, 9th Edition, 1995.

3. S.S. Sabharwal, Sunita Jain, Eagle Parkashan, Applied Mathematics, Vol. I & II, Jalandhar.

4. Comprehensive Mathematics, Vol. I & II by Laxmi Publications, Delhi.

5. Reena Garg & Chandrika Prasad, Advanced Engineering Mathematics, Khanna Publishing House, New Delhi

DEA - 205 [ENGINEERING GRAPHICS]

Note: Only first angle projection method is to be followed

UNIT 1

INTRODUCTION TO DRAWING: Instrumentation. Planning and layout of drawing sheet: lines, lettering and dimensioning metrical constructions and engineering curves: geometrical representation of line and objects: introduction of conic sections (curves). Construction of ellipse by eccentricity and concentric circles methods construction of parabola by eccentricity and rectangle methods construction of hyperbola by eccentricity method construction of cycloid. construction of involutes of circle and polygon. construction of Archimedean spiral of any number of convolutions. scales: introduction of scales and their applications, concept of reducing, enlarging and full size scale, classification of scales and their construction

UNIT 2

THEORY OF PROJECTION: Projection of point, lines, plane and solid**.** Definition of various term associated with theory of projection- Planes of projection, Quadrants, first & third angle projection method. Projection of points in all the four quadrants and related cases. Projection of planes and solids.

UNIT 3

SURFACE INTERSCTION AND ORTHOGRAPHIC PROJECTIONS:

Intersection of Surfaces**:** Cylinder to cylinder and Prism to prism (With their axis intersecting and perpendicular to each other). Principles of orthographic projections. Identification of necessary views. Preparation of necessary orthographic views of simple objects. Pictorial view representation. Dimensioning of orthographic views as per standard practice. Free hand sketches of simple objects (Using Pencil, Eraser & Paper only)

UNIT 4

ISOMETRIC VIEWS: Concept of isometric projection and isometric view (Isometric Drawing). Construction of isometric scale. Construction of isometric view of polygon, circle and solids

UNIT 5

COMPUTER AIDED DRAFTING INTERFACE

Computer Aided Drafting: concept. Hardware and various CAD software available.Components of AutoCAD software window: Title bar, standard tool bar, menu bar, objectproperties tool bar, draw tool bar, modify tool bar, cursor cross hair. Command window, status bar, drawing area, UCS icon.File features: New file, Saving the file, Opening an existing drawing file, Creating templates,Quit. Setting up new drawing: Units, Limits, Grid, Snap.Undoing and redoing action.

COMPUTER AIDED DRAFTING

Draw basic entities like Line, Circle, Arc, Polygon, Ellipse, Rectangle, Multiline, PolyLine. Method of Specifying points: Absolute coordinates, Relative Cartesian and Polar coordinates. Modify and edit commands like trim, extend, delete, copy, offset, array, block, layers. Dimensioning: Linear, Horizontal Vertical, Aligned, Rotated, Baseline, Continuous, Diameter, Radius, Angular Dimensions.

LIST OF EXPERIMENT:

1 Draw horizontal, Vertical, 30 degree, 45 degree, 60 and 75 degrees lines, different types of lines, dimensioning styles using Tee and Set squares/ drafter. (do this exercise in sketch book)
2 Write alphabets and numerical (Vertical only) (do this exercise in sketch book)
3 Draw regular geometric constructions and redraw the given figure (do this exercise in sketch book)
4 Draw regular geometric construction and redraw the given figure (do this exercise in sketch book)
5 Draw a problem on orthographic projections using first angle method of projection having plain surfaces and slanting.
6 Draw another problem on orthographic projections using first angle method of projection having slanting surfaces with slots. Part II
7 Draw two problems on orthographic projections using first angle method of projection having cylindrical surfaces, ribs.
8 Draw two problems on Isometric view of simple objects having plain and slanting surface by using natural scale.
9 Draw some problems on Isometric projection of simple objects having cylindrical surface by using isometric scale
10 Draw basic 2D entities like: Rectangle, Rhombus, Polygon using AutoCAD
(Print out should be a part of progressive assessment).

REFERENCE BOOKS:

1. Engineering Drawing - N.D. Bhatt
2. Engineering Drawing - R.K. Dhawan
3. Engineering Drawing - P. S.Gill
4. First Year Engineering Drawing - Ac.Parkinson
5. Sp: 46-1988 Bureau Of Indian Standard -
6. Principles Of Electronics - Malvino