

SCHEME OF INSTRUCTIONS
BE I YEAR I SEMESTER
(COMPUTER SCIENCE AND ENGINEERING)

THEORY

Sl.No	Syllabus Ref. No.	Subject
1.	EG 101	English
2.	MT 101	Mathematics - I
3.	MT 102	Mathematics - II
4.	PH 101	Engineering Physics
5.	CH 101	Engineering Chemistry
6.	CS 101	Programming in C & C++
7.	CE 101	Engineering Mechanics
8.	CE 102	Engineering Graphics

PRACTICALS

Sl.No	Syllabus Ref. No.	Subject
1.	PH 132	Physics Lab
2.	CH 132	Chemistry Lab
3.	ME 131	Workshop Practice
4.	CS 131	Programming Lab
5.	EG 131	English Language Lab

EG 101 UE

ENGLISH (THEORY)

Instruction	3 Periods per week
Duration of University Examination	3 Hours
University Examination	75 Mark
Sessional	25 Marks

The following are the objectives of the Course:

To enable the students to

- Communicate clearly, accurately and appropriately
- Know how to use verbal and non-verbal communication appropriately
- Infer information from texts
- Learn basic grammar of English language
- Learn different models of interpersonal communication
- Write reports, scientific papers, letters, statement of purpose, resume

UNIT-I

Effective Communication : Role and importance of communication; Features of human communication; Process of communication; Types of communication: Verbal - Formal versus informal communication, one way versus two-way communication; Non-verbal communication; Barriers to communication;

UNIT-II

Oral communication: Importance of oral communication; Importance of listening in effective communication.; Interpersonal Communication, Models of interpersonal development - Johari Window; Styles of communication, persuasion techniques.

UNIT-III

Written Communication : Paragraph writing; precis writing, expansion, essay writing, Report writing; Types of reports, Writing technical reports; writing scientific papers; Communication through letters: official and personal letters, letters of complaint, letters of enquiry and responses, resume writing; cover letters, writing a statement of purpose, e-mail etiquette, mobile etiquette.

UNIT-IV

Remedial English : Common errors, words often confused, tense and aspects, articles, prepositions, connectives and correlative conjuncts, voice, concord, direct and indirect speech, question tags, punctuation, homonyms, homophones, synonyms, antonyms, one-word substitutes; Idiomatic usage, degrees of comparison, affixes.

UNIT-V

Reading comprehension, reading strategies.

The following five lessons are prescribed :

1. Dr. APJ Abdul Kalam
2. Sathya Nadella
3. Azim Premji.
4. Sachin Tendulkar
5. Sam Pitroda

Textbook Prescribed:

1. E. Suresh Kumar, Engineering English, Orient Blackswan, 2014

Suggested Reading :

1. E. Suresh Kumar et al., *Communication Skills and Soft Skills*, Pearson, 2011.
2. Sanjay Kumar and Pushp Lata, *Communication Skills*, OUP, 2011
3. Kavita Tyagi and Padma Misra, *Professional Communication*, PHI, 2011.
4. Meenakshi Raman and Sangeeta Sharma, *Technical Communication: Principles and Practice*, OUP, 2011.

MT 101

MATHEMATICS - I

Instruction	3 Periods per week
Duration of University Examination	3 Hours
University Examination	75 Mark
Sessional	25 Marks

UNIT-I

Infinite Series:

Sequences, Infinite series, Convergence and Divergence , P-Series test, Geometric series test, Comparison tests, D'Alembert's Ratio test, Raabe's test, Cauchy's nth root test , Logarithmic test, Alternating series, Leibnitz's test, Absolute convergence, Conditional convergence..

UNIT -II

Differential Calculus:

Rolle's theorem, Lagrange's and Cauchy's mean value theorems, Taylor's series, Curvature, Radius of curvature , Envelopes, Evolutes and Involutives,

Asymptotes of a curve, Curve sketching (cartesian, polar and parametric co-ordinates).

UNIT-III

Functions of Several Variables:

Limits and Continuity of Functions of two variables, Partial derivatives, Total differentials and derivatives, Derivatives of composite and implicit functions, Higher order partial derivatives, Taylor's theorem for functions of two variables, Maxima and minima of functions of two variables, Lagrange's multipliers method, Jacobian, Change of variables, Multiple integrals.

UNIT-IV

Vector Calculus :

Scalar and vector fields, Vector differentiation, Gradient of a scalar field, Directional derivative, Divergence and Curl of a vector field, Line, Surface and Volume integrals , Green's theorem in a plane, Gauss's divergence theorem, Stoke's theorem and their applications.

UNIT - V

Linear Algebra: Vector spaces, Subspace, Linearly dependence and independence of vectors, Basis and dimension, Linear transformation, Elementary row and column operations. Rank of a Matrix, Echelon form, System of linear equations, Eigenvalues, Eigenvectors, Cayley-Hamilton theorem,

Diagonalization, Quadratic forms.

Suggested Reading:

- 1) R.K.Jain and S.R.K.Iyengar, "*Advanced Engineering Mathematics*", Narosa Publications, Fourth Edition, 2014.
- 2) Dr. B.S. Grewal, "*Higher Engineering Mathematics*", Khanna Publications, 41st Edition, 2011.
- 3) Erwin Kreyszig, "*Advanced Engineering Mathematics*", Wiley-India, 9th Edition, 2012.
- 4) Manice D. Weir, Joel Hass, Frank R. Giordano, "*Thomas' Calculus*", Pearson Publications, 1st Edition.
- 5) H.K. Dass and Er.Rajnish Varma "*Higher Engineering Mathematics*", S.Chand & Company-2011.

WITH EFFECT FROM THE ACADEMIC YEAR 2014 - 2015

MT 102

MATHEMATICS - II

Instruction	3 Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

UNIT - I

Ordinary Differential Equations of First Order :

Introduction to Differential Equations, Exact First Order Differential Equations , Integrating Factors, Linear First Order Equation , Bernoulli's Equation, Riccati's Equation, Clairaut's Equation, Orthogonal Trajectories of a Given Family of Curves, RL - Circuit, RC - Circuit, Newton's Law of Cooling, Law of Growth and Decay .

UNIT- II

Linear Differential Equations of Higher Order :

Solutions of Linear Homogeneous and Non-homogeneous Differential Equations with Constant Coefficients, Solution of Euler-Cauchy Equation, Linearly Dependence and Independence of Functions, Method of Reduction of Order, Method of Variation of Parameters, Simultaneous Differential Equations.

UNIT - III

Series Solutions of Differential Equations :

Ordinary and Singular Points of an Equation, Power Series Method, Frobenius Method, Legendre's Differential Equation and Legendre Polynomials $P_n(x)$, Rodrigue's Formula, Generating Function for Legendre's Polynomials $P_n(x)$, Recurrence Relations for Legendre's Polynomials $P_n(x)$, Orthogonal Property of Legendre Polynomials $P_n(x)$, Fourier-Legendre Series.

UNIT - IV

Special functions :

Gamma Function, Beta Function, Relation between Gamma and Beta Functions, Error Function. Bessel's Differential Equation, Bessel's Functions of the First Kind , Derivatives and Integrals of Bessel's Functions, Recurrence Relations for Bessel Functions, Generating Function for Bessel Functions.

UNIT - V

Laplace Transforms:

Introduction to Integral Transforms, Kernel of Integral Transforms, Laplace Transform, Inverse Laplace Transform, Properties of Laplace and Inverse Laplace transforms , Laplace Transform of Unit step Function, Impulse Function and Periodic Function, Convolution Theorem, Solution of Ordinary Differential Equations using Laplace Transform.

Suggested Reading:

- 1) R.K.Jain and S.R.K.Iyengar, "Advanced Engineering Mathematics", Narosa Publications, 4th Edition, 2014.
- 2) **Dr. B.S. Grewal, "Higher Engineering Mathematics", Khanna Publications, 41q Edition, 2011.**
- 3) M.D. Rai Singhania , "*Ordinary and Partial Differential Equations*", S. Chand Publications, **15th** Edition.
- 4) 'Eerwin Kreyszig, "*Advanced Engineering Mathematics*", Wiley-India, 9th Edition, 2012
- 5) Kanti **B.Datta, "Mathematical Methods of Science and Engineering", Cengage Learning, 2012.**

PH 101

ENGINEERING PHYSICS

Instruction	3 Periods per week
Duration of University Examination	3 Hours
University Examination	75 Mark
Sessional	25 Marks

UNIT - 1(20 Periods)

1.1 Interference : Coherent and non-coherent sources - Division of amplitude and division of wave front - interference in thin films(reflected light) - Newton's rings - Fresnel's biprism.

1.2 Diffraction : Distinction between Fresnel and Fraunhofer diffraction - Diffraction at a single slit - Double slit diffraction - Diffraction grating(N-slits)

1.3 Polarization : Introduction - Malus's law - Double refraction - Nicol's prism - Quarter wave and half wave plates - Optical activity - Laurent's half shade polarimeter.

1.4 Lasers and Holography : Characteristics of Lasers - Spontaneous and stimulated emission of radiation - Population inversion - Ruby laser - Helium-Neon Laser - Semiconductor Laser - Applications of lasers. Basic principles of holography - Construction and reconstruction of image on hologram - Applications of holography.

UNIT - II (16 Periods)

2.1 Elements of Statistical Mechanics : Maxwell-Boltzmann Statistics- Bose Einstein statistics - Fermi-Dirac statistics - Photon gas - Planck's law of black - body radiation - Rayleigh Jean's law and Wien's law.

2.2 Wave Mechanics : Physical significance and properties of wave function - Schrodinger's time dependent and time independent wave equations - Particle in an infinite Square well potential (particle in a box).

2.3 Fiber Optics : Introduction - Propagation of light through an optical fiber - Critical angle - Acceptance angle - Numerical aperture (NA)- Types of optical fibers and refractive index profiles - Fibre drawing process (double crucible method) - Application of optical fibers.

UNIT - III (20 Periods)

3.1 Crystallography : Introduction - Space lattice - Basis - Unit cell - Bravais lattices and crystal systems - Atomic radius - Coordination numbers - Effective number of atoms per unit cell - Packing fraction (for simple cubic, body centered cubic and face centered cubic crystals) - Miller Indices - Bragg's law - Experimental determination of lattice constant by powder diffraction method. Classification of defects in crystals (in brief) - Concentration of Schottky defects in metals and in ionic crystals - Concentration of Frenkel defects in a crystal.

3.2 Band Theory of Solids : Classical free electron theory (qualitative)- Energy band formation in solids - Kronig - Penney model (qualitative treatment) - Electron gas - Fermi energy and Fermi level in metals - Classification of solids into conductors, semiconductors and insulators.

3.3 Semiconductors : Intrinsic and Extrinsic semiconductors - Concept of hole - Concept of Fermi level in semiconductor - Carrier concentration and conductivity in intrinsic semiconductors - P-N junction diode and its I-V characteristics - LED - Thermistor - Hall effect.

UNIT- IV (18 Periods)

4.1 Dielectric Materials : Dielectrics - Types of dielectric polarizations - Expression for electronic polarization - Ionic, orientational and space-charge polarizations - Frequency and temperature dependence of dielectric polarizations - Determination of dielectric constant by capacitance Bridge method - Ferro electricity - Barium titanate -Applications of Ferroelectrics.

4.2 Magnetic Materials : Classification of magnetic materials - Dia, para, ferro, antiferro and ferrimagnetism - Weiss molecular field theory of ferromagnetism - Magnetic domains - Magnetic hysteresis curve -Soft and hard magnetic materials - Ferrites and their applications.

4.3 Superconductivity - General properties of superconductors -Meissner effect - Type I and Type II superconductors - BCS Theory (in brief) - High T_c superconductors (in brief) - Applications of superconductors.

UNIT - V (16 Periods)

5.1 Thin Films : Distinction between bulk, thin films and nano materials - Thin film preparation techniques : Physical vapor deposition (PVD).Thermal evaporation, Electron beam evaporation, Sputtering and chemical vapour deposition (CVD) - Applications of thin films - Solar cells.

5.2 Nano materials : Zero dimensional materials - Properties of materials at reduced size - Surface to volume ratio at nano scale -Quantum confinement - Preparation of nanomaterials : bottom-up methods (sol gel, sputtering and CVD),Top-down methods (ball milling) - Elementary ideas of carbon nanotubes - Applications.

5.3 Experimental Techniques for Characteristics of Materials :X-ray fluorescence - Atomic force microscopy (basics) - Electron microscopy (SEM and TEM)

Suggested Reading :

1. M.S. Avadhanulu and P.G. Kshirasagar, *A Text Book of Engineering Physics*, S. Channd & Co., 9th edition, 2010.
2. R.K. Gaur and S.L. Gupta, *Engineering Physics*, Dhanpat Rai Publications, 8th edition, 2001.
3. B.K. Pandey and S. Chaturvedi, *Engineering Physics*, Cenage Learning India (P) Ltd., 2012.
4. R. Murugesan and K. Sivaprasath, *Modern Physics*, S. Chand & Company, 13th edition, 2007.
5. David Halliday, Robert Resnick and Kenneth S. Krane, *Physics (Vol. 2)*, Wiley-India (P) Ltd., 5th edition, 2007.
6. A. Goswami, *Thin Film Fundamentals*, New Age Internatational, 2007.
7. A.K. Bandhopadyaya, *Nano Materials*, New Age International, Ist edition, 2007.
8. C.M. Srivastava and C. Srinivasan, *Science of Engg. Materials*, New Age International, 2002.

CH 101**ENGINEERING CHEMISTRY**

Instruction	3 Periods per week
Duration of University Examination	3 Hours
University Examination	75 Mark
Sessional	25 Marks

UNIT - I : ELECTROCHEMISTRY**1.1 Electrodictics :**

Electrochemical Cells — Electrolytic and Galvanic Cells. Cell notation. Concept of electrode potential and EMF. Determination of single electrode potential. Electrochemical Series-significance. Nernst equation derivation and applications - Numerical Problems. Types of Electrodes (a) Gas Electrode (Standard Hydrogen Electrode) (b) Metal- insoluble salt Electrode (Calomel Electrode) (c) Redox Electrode (Quinhydrone Electrode) (d) Ion selective electrode (Glass electrode)

1.2. Electroanalytical Techniques:

Principle, method and applications of the following techniques. Conductometry: Acid — Base titrations. Potentiometry: Acid — Base and Redox titrations. pH metry: Acid — Base titrations.

1.3. Battery Chemistry:

Concept of Reversible and Irreversible cells. Primary, secondary and flow batteries: Zinc—AgO, Nickel-Cadmium and Lithium- Ion batteries — Construction, working and applications. Flow batteries (Fuel Cells): Hydrogen — Oxygen and Methanol — Oxygen fuel cells.

UNIT II : CORROSION AND WATER CHEMISTRY**2.1 Corrosion and its control:**

Causes and effects- Types of corrosion-Chemical (dry) and electrochemical (wet) corrosion — Mechanism of electrochemical corrosion —Formation of anodic and cathodic areas — Galvanic corrosion, differential aeration corrosion (waterline and pitting corrosion) Factors affecting the rate of Corrosion (a) Position of metals in Galvanic Series. (b) Relative areas of anode and cathode. (c) Nature of corrosion product, (d) Temperature (e) Humidity and (f) pH - Pourbaix diagram Corrosion Control Methods: Cathodic Protection — Sacrificial Anode and Impressed Current Methods.

2.2 Surface Coating:

Types of Metallic Coatings, Anodic and Cathodic Coatings-Methods of application of metallic coatings-Electroplating (Nickel Plating) and Electroless plating (Copper Plating). Paints-constituents and their functions.

2.3. Water Chemistry:

Hardness of water-Types — Units of hardness - Determination of temporary and Permanent Hardness of water by EDTA Method (numerical problems) - Alkalinity of water & its determination. Water softening by Ion- Exchange and Reverse Osmosis methods. Specifications of potable water (BIS/WHO standards). Disinfection of drinking water by chlorination-Break point chlorination and Ozonization.

UNIT-III: ENGINEERING MATERIALS**3.1 Polymers:**

Definition of Monomer, Polymer and degree of polymerization. Functionality of monomer. Classification of polymers-Homo, Hetero and Copolymers, Thermoplastics & Thermosetting resins. Types of Polymerization: Addition, Condensation and Co-Polymerisation -

Examples. *Preparation, Properties & Applications of the following polymers:* (i) Plastics: Teflon, PMMA and Bakelite. (ii) Fibers: Kevlar and Polyurethane (Perlon-U). (iii) Rubbers/Elastomers: Natural rubber and its chemical structure. Artificial rubbers: Buna-S, and Silicone Rubbers. Compounding of rubber

3.2. Conducting polymers:

Definition. Classification: Extrinsic and Intrinsic polymers. Mechanism of conduction in polyacetylene. Structure of polypyrrole and its doping. Applications of conducting polymers.

33 Composites:

Basics of composites, composition and properties of composites. Types of composites — Fiber Reinforced composites: Glass Fiber and Carbon fiber. Advantages and applications.

UNIT-IV: CHEMICAL FUELS

4.1 Fossil fuels

Classification of fuels: Primary, Secondary fuels. Solid, liquid and gaseous fuels. Requirements of a good fuel. Calorific Value: HCV and LCV. Determination of Calorific value of gaseous fuels by Junkers Calorimeter. Theoretical calculation of calorific value by Dulong's formula - numerical problems. Combustion — Calculation of air quantities by weight and volume- Numerical problems.

Solid Fuels: Coal and its Ranking. Analysis of coal- Proximate and Ultimate analysis. Liquid Fuels: Fractionation of Petroleum. Composition and uses of Gasoline, Diesel and Kerosene. Cracking & its Significance - Catalytic cracking by Moving bed method. Knocking. Fuel rating - Octane and Cetane numbers. Unleaded Petrol - Additives. Automobile Exhaust control by Catalytic Converters. Gaseous Fuels - LPG, CNG composition and uses.

4.2 Bio Diesel

Sources. Concept of Trans esterification. Properties and significance

4.3 Rocket Fuels:

Principles of rocket propulsion, Characteristics of a good propellant-Classification of rocket fuels.

UNIT- V: LIQUID CRYSTALS, LUBRICANTS, PHASE RULE AND GREEN CHEMISTRY

5.1. Liquid Crystals:

Introduction, classification of liquid crystals — Thermotropic and Lyotropic liquid crystals. Molecular ordering in liquid crystals. Nematic, Smectic and Cholestric liquid crystals and their applications

5.2 LUBRICANTS:

Definition and functions of lubricants. Mechanism of lubrication: Boundary film, hydrodynamic and extreme pressure lubrication. Classification of lubricants: solid, semisolid and liquid lubricants. Properties of lubricants: Saponification number and acid value.

5.3 Phase Rule:

Definition of terms phase, components and degrees of freedom. Statement of Phase rule. Phase rule equation and its application to one component system - water system and two components system - Pb-Ag system. Pattinson's Process of desilverization of lead.

5.4. Green Chemistry

Concept and principles of green chemistry and examples of clean technology.

Suggested Reading :

1. *Principles of Physical Chemistry* by Puri, Sharma and Pathania S. N., S. Chand & Co. New Delhi (Latest edition).
2. *Engineering Chemistry* by P C Jain and M Jain. Dhanpat Rai & Sons (15th Edn), New Delhi.
3. *Engineering Chemistry* by Sashi Chawla. Dhanpat Rai & Sons, New Delhi
4. *Chemistry in Engineering and Technology* by J C Kuriacose and J Rajaram, TMH, New Delhi.
5. *Engineering Chemistry* by O G Palanna, TMH, New Delhi.
6. *Engineering Chemistry* by S S Dara, S Chand & Sons, New Delhi.

CS 101**PROGRAMMING IN C & C++**

Instruction	3 Periods per week
Duration of University Examination	3 Hours
University Examination	75 Mark
Sessional	25 Marks

UNIT-I

Introduction of Computers : Components, Block diagram, Operating Systems, Programming Languages, Assembler, Interpreter, Compiler, Loader, Linkers. Number Systems (Binary, Octal), Decimal and Hexal), Representation of numbers (fixed and floating point), Problem Solving : Algorithm, Flow Charts.

Basics of C: Structure of a C Program, Variables, Identifiers, Keywords, Data Types and Sizes, Constants, Declarations, Assignment & Initialization, Operators & Expressions, Precedence and Order of Evaluation, Type Conversions.

Input and Output: Non- Formatted input & output, Formatted input & output.

Control Statements : Specifying Test Condition for Selection & Iteration, Conditional Execution & Selection, Iteration & Repetitive Execution, Goto Statement, Special Control Statements, Nested Loops.

UNIT-II

Arrays : One-Dimensional Array- Declaration, Initialization, Accessing Array Elements, Multi-Dimensional Array-Declaration, Initialization, Accessing Multi-Dimensional Arrays, Linear Search and Binary Search, Selection and Bubble Sort.

Functions : Concept of Function, Using Functions, Parameter Passing techniques, Passing Arrays to Functions, Scope & Extent, Storage Classes, Recursion.

C Preprocessor: #include, #define, #if, conditional compilation.

Pointers : Pointers and Addresses, Address Operator, Declaring a Pointer, Initializing the Pointer, Pointer Referencing, Void Pointer, Null Pointer. Pointer and Function Arguments, Pointer Arithmetic, Arrays & Pointers, Pointers to Pointers, Implementing Multi Dimensional arrays using pointers, Command line arguments.

UNIT-III

Structures and Unions : Basics, Structure and functions, arrays of structures, Pointers to Structures, Self Referential Structure, Union and Enumeration Types.

Files : Basics and File Handling functions : Copy file and display file text Files.

UNIT-IV

C++ : Introduction, simple program, standard library, header files, inline functions, references and reference parameters, default arguments, empty parameter lists, unary, scope resolution operator, function overloading.

Classes and data abstraction : Class scope, accessing class members, constructors, destructors, constant objects and member functions, this pointer, new and delete operators, Static Data Members and Member Functions.

C++ Operator overloading : Fundamentals, restrictions, overloading unary / binary operators, overloading ++ and -- Operators.

UNIT-V

C++ Inheritance : Base and derived classes, casting base class, pointers to derived class pointers, overriding, member functions, public, protected and private inheritance, constructors and destructors in derived classes.

C++ Virtual Functions : Abstract base class, polymorphism, dynamic binding, virtual destructors.

C++ Stream Input/Output : Streams, stream output, stream input.

C++ Templates : Introduction, class templates, templates and inheritance, templates and static members.

C++ Exception Handling : Try, throw, catch.

Suggested Reading :

1. Pradip Dey, Manas Ghosh, *Programming in C, Second edition*, Oxford University Press, 2011.
2. Sourav Sahay, *Object Oriented Programming with C++, Second edition*, Oxford University Press, 2012.
3. Raja Raman, *Computer Programming in C*, PHI Learning, 2013.
4. Bhushan Trivedi, *Programming with ansi C++, Second edition*, Oxford University Press, 2012.
5. K.R. Venugopal & RaJKumar Buyya, *Mastering in C++, Second Edition*, McGraw Hill Education, 2013.
6. Harry H. Cheng, *C/C++ for Engineers and Scientists*, TMH 2010.

CE 101

ENGINEERING MECHANICS

Instruction	3 Periods per week
Duration of University Examination	3 Hours
University Examination	75 Mark
Sessional	25 Marks

UNIT - I

System of forces: - Introduction — statics, concept of force, components of forces in a plane, Resultant of coplanar concurrent forces, moment of force and its coplanar applications, Couple- Resultant of coplanar non concurrent forces.

Equilibrium of forces: - Free body diagrams, equations of equilibrium, equilibrium of planar force system.

UNIT - II

Spatial Force System:- Components of forces, Resultant of forces, vector notation- Dot and cross product, moment of force and its applications, equilibrium of concurrent force system.

Friction: - Theory of friction, types of friction, laws of friction, application of friction to a single body and connecting systems, wedges, Introduction to belt friction.

UNIT - III

Centroid and centre of gravity:- Significance of centroid and moment of area. Centroids of elementary areas and lines, composite areas. Theorems of Pappus & its applications, centroid of volumes. centre of gravity of bodies.

Moment of Inertia:- Definition, polar Moment of Inertia, transfer formula, Moment of Inertia of elementary areas and composite areas. Product of inertia of elementary and composite areas. Mass moment of inertia of elementary bodies.

UNIT — IV

Kinematics: - Introduction to Dynamics, Rectilinear motion, curvilinear motion, Normal and tangential components of acceleration, types of rigid body motion, fixed axis rotation

Kinetics: D' Alembert's principle applied to particle motion, connected systems. Analysis as a rigid body in translation and fixed axis rotation.

UNIT — V

Work Energy Method: - Equation of translation, work energy principle applied to particle motion and connected systems, fixed axis rotation. **Impulse and Momentum:-** Introduction, linear impulse momentum, principle of conservation of linear momentum, elastic impact and types of impact, loss of kinetic energy, co-efficient of restitution.

Suggested Reading :

1. **F.L Singer**, *Engineering Mechanics*, Harpper Collins Publishers, India. 1975

2. Vijay Kumar Reddy et al, Singer's, *Engineering Mechanics Statics & Dynamics SI Units*, **B.S** Publications, 2014

3. S.S. Bhavikatti et al, *Engineering Mechanics*, New Age International, 1994.

Text Books for Reference :

1. M.V. Shashigiri Rao et al, *Engineering Mechanics*, Universities Press, 2005

2. R. C Hibbeler et al , *Engineering Mechanics*, Pearson education, 2009.

3. S. Rajasekaran et al, *Engineering Mechanics*, Vikas Publications, 1999.

4. Basudeb Bhattacharya, *Engineering Mechanics*, Oxford Press, 2014

5. N H Dubey, *Engineering Mechanics*, **Mc Graw Hill Education (India) Private Limited, 2014**

CE 102

ENGINEERING GRAPHICS

Instruction	3 Periods per week
Duration of University Examination	3 Hours
University Examination	75 Mark
Sessional	25 Marks

UNIT-I

Instruments and their use: Lettering and types of lines. Scales reduced & enlarged scales, representative fraction, types of scales -plain, diagonal & vernier.

Geometrical construction: - Construction of regular polygons inscribed in a circle, given the side of the polygon or diameter of a circle.

Curves used in engineering practice: - Conic sections-Ellipse, Parabola & Hyperbola. Cycloid, Epi cycloid, hypocycloid & Involute for one turn.

UNIT-II

Projections of points and straight lines: - Points placed in different quadrants. Projections of straight lines in first angle projection and traces.

Projections of planes: - Perpendicular planes, traces of planes, oblique planes and auxiliary planes.

UNIT - III

Projections of solids: - Polyhedra, solids of revolution, projection of solids in simple positions, axis inclined to one and both the reference planes.

UNIT - IV

Sections of solids: - True shape of section, sections of prisms, pyramids, cylinders and cones.

Development of surfaces: - Development of surface of various solids such as prisms, pyramids, cylinders and cone in simple position.

UNIT - V

Isometric Projections: - Isometric view, Isometric scale, Isometric projections/views of prisms, pyramids, cylinder, cone, sphere and combination of two or three solids.

Orthographic projections: - Conversion of pictorial view (isometric view) to orthographic view in first angle projection.

Suggested Reading :

1. N.D. Bhatt, *Elementary Engineering Drawing*, Charotar Publications, 2004.
2. Basant Agarwal & C.M. Agarwal, *Engineering Drawing*, Tata McGraw Hill Education Pvt. Ltd., 2014
3. K.L. Narayana & P. Kannaiah, *Text Book of Engineering Drawing*, Scitech publications, 2002

Text Books for Reference :

1. K. Venugopal, *Engineering Drawing & Graphics + AutoCAD*, New Age International, 2007.
2. P.S. Gill, *Engineering Drawing*, S.K. Kataria & Sons, 2009.
3. B.V.R. Gupta & M. Raja Roy, *Engineering Drawing*, I.K. International Publishing House Pvt. Ltd., 2009.

PH 132**PHYSICS LAB**

Instruction	3 Periods per week
Duration of University Examination	3 Hours
University Examination	50 Mark
Sessional	25 Marks

Note : Among the following list of experiments, a minimum of 15 experiments have to be conducted.

1. P-N Junction Diode characteristics
2. Determination of Dielectric characteristics
3. B-H curve
4. Determination of Planck's constant using Photocell
5. CRO - Measurement of frequency, phase and amplitude
6. Characteristics of a Solar cell
7. Newton's Rings
8. Diffraction due to a single slit.
9. Diffraction due to double slit
10. Diffraction Grating (normal incidence)
11. Determination of wavelength of semiconductor laser
12. Polarimeter
13. Optical Fibre - To determine Numerical Aperature, Acceptance, Acceptance angle and Power loss.
14. Holography - recording and reconstruction
15. Hall effect
16. Thermoelectric power
17. Verification of Malus's law
18. Double refraction
19. Thermistor characteristics
20. Energy gap of a semiconductor

Demonstration Experiments

1. Michelson's Interferometer
2. Four probe resistivity
3. Preparation of nonomaterials - sol gel method.

CH 132

CHEMISTRY LAB

Instruction	3 Periods per week
Duration of University Examination	3 Hours
University Examination	50 Mark
Sessional	25 Marks

VOLUMETRIC ANALYSIS

1. Introduction of Volumetric Analysis.
2. Techniques of Weighing and usage of Simple analysis balance.

PERMANGANOMETRY

3. Preparation of standard solution of Mohr salt and standardization of KMnO_4 solution.
4. Estimation of Iron(II)
5. Estimation of oxalate

DICHROMATOMETRY

6. Estimation of Chromium(III).

IODOMETRY

7. Estimation of Chromium(III).
8. Estimation of Copper (II)

ALCALIMETRY

9. Estimation of Carbonate, Bicarbonate alkalinity of water

COMPLEXOMETRY

10. Estimation of hardness of water.

PRECIPITATION TITRATION

11. Estimation of Chloride

INSTRUMENTAL CHEMICAL ANALYSIS

12. Introduction to instrumental chemical analysis and use of electrical and electronic balance up to 4th decimal place.

CONDUCTOMETRY**13. Acid-base titration**

- a. Estimation of HCl using strong base.
- b. Estimation of CH_3COOH using strong base.
- c. Estimation of HCl and CH_3COOH using strong base

Precipitation titration

- d. Estimation of BaCl_2 using Na_2SO_4

POTENTIOMETRY**14. Acid base titration**

- e. Estimation of HCl using strong base by quinhydrone electrode.
- f. Estimation of CH_3COOH strong base titration using quinhydrone electrode.

Redox titration

15. Estimation of iron(II) using $\text{K}_2\text{Cr}_2\text{O}_7$.

PH METRY**16. Acid base titration**

- a. Estimation of HCl using NaOH

b. Estimation of CH_3COOH using NaOH

COLORIMETRY

17. Verification of Beers-Lambert's Law: using potassium permanganate and estimation of KMnO_4 (Mn) in the given solution.

18. Estimation of MnO_4 in the given solution.

19. Estimation of Copper(II)

KINETICS

20. First order reaction - hydrolysis of methyl acetate

EXPERIMENTS FOR DEMONSTRATION SPECTROPHOTOMETRY

1. Recording of Cu(II) spectrum, determination of λ_{max} and molar absorbance

PREPARATION OF POLYMERS

1. Preparation of Urea — Formaldehyde resin

2. Preparation of polypyrrole

Suggested Reading:

1. B.D.Khosla, A.Gjulati, V.C. Garg., *Senior Practical Physical Chemistry*, R.Chand and company, New Delhi 11th Edition.

2. S.K.Bhasin and Sudha RAni, *Laboratory Manual on Engineering Chemistry*, Dhanpat Raj Publishing Company.

ME 131**WORKSHOP PRACTICE**

Instruction	3 Periods per week
Duration of University Examination	3 Hours
University Examination	50 Mark
Sessional	25 Marks

Branch of Engg.	Trades for Practice	Trades for Demonstration
Mechanical Production Civil EEE	Fitting Carpentary House Wiring Welding Plumbing	Sheet Metal Work Smithy PC Assembly
CSE ECE IT IT	Fitting Carpentary House Wiring Sheet Metal Work Plumbing	Welding Smithy PC Assembly

Grades for exercises in the trades for practice shall be given to the student Emphasis must be given for developing necessary skills.

CS 131

PROGRAMMING LAB

Instruction	3 Periods per week
Duration of University Examination	3 Hours
University Examination	50 Mark
Sessional	25 Marks

Write the following Programs Using C Programming Language

1. Sin x and Cos x values using series expansion.
2. Frequency of occurrence and special characteristics like n\t, white spaces.
3. Bubble sort with an array.
4. Linear and Binary Searches.
5. Matrix addition and multiplication using pointers.
6. Generation of address labels using structures.
7. Sequential file operations.
8. Functions of string manipulations without using library functions.

Write the following Programs using C++ Programming Language.

1. Finding maximum, minimum and sum of given set of numbers.
2. Implementation of a matrix class.
3. Classes for Bank Account, Student Information, Library catalog.
4. Creation of complex class with operator overloading.
5. Creation of inheritance hierarchy for graphic shapes.
6. Template functions for min () and max () for finding minimum and maximum in a list of numbers.
7. Programs for finding the number of characters, words and sentences in the given text input.
8. Program to write error Handling Code using Exceptions.

EG 131**ENGLISH LANGUAGE LAB**

Instruction	3 Periods per week
Duration of University Examination	3 Hours
University Examination	50 Mark
Sessional	25 Marks

The following are the objectives of the course :

To enable the students to

- learn the sound systems of English
- understand word stress of English
- participate in group discussions and debates
- improve their presentation and participation skills
- understand how interviews are conducted

Note : While teaching the following items, emphasis may be laid on intensive practice in the language lab. Lecturing may be avoided, as far as possible.

1. Introduction to English Phonetics : Organs of Speech : the respiratory, articulatory and phonatory systems.
2. Sound Systems of English : Phonetic sounds, introduction to International Phonetic Alphabet, classification and description of English phonetic sounds; minimal pairs; The syllable
3. Connected Speech : Strong forms, weak forms, contracted forms, ellision.
4. Word Stress : Primary stress, secondary stress, functional stress, rules of word stress.
5. Rhythm and Intonation : Introduction to rhythm and intonation.
6. Presentation Skills : Making effective presentations, expressions which can be used in presentations, use of non-verbal communication, coping with stage fright, handling questions and answer session use of audio visual aids, power point presentations.
7. Interview Skills : Planning and preparing for interviews, facing interviews confidently, use of suitable expressions during interviews.
8. Group Discussion : Objectives of GD; Types of GD's Initiating, continuing and concluding a GD; Team work.
9. Debate : Differences between a debate and a group discussion, essentials of a debate, participating in a debate.
10. Public Speaking : Advantages of public speaking, essentials of an effective speech, rehearsal techniques, planning and delivering a speech, speaking strategies.
11. Role play : Use of dialogues in a variety of situations and settings.
12. Use of dictionary and thesaurus : Advantages of using a dictionary and thesaurus effective use of dictionary and thesaurus.
13. Listening activities

Lab Manual Recommended :

1. E. Suresh Kumar, *A Handbook for English Language Laboratories (with CD) Revised edition*, Cambridge University Press India Pvt. Ltd. 2014

Books Recommended :

1. T. Balasubramanian, *A Text book of English Phonetics for Indian Students*, Macmillan, 2008.
2. Edgar Thorpe, *Winning at Interviews*, Pearson Education, 2006.
3. J. Sethi et al, *A Practical Course in English Pronunciation (with CD)*, Prentice Hall of India, 2005.
4. Hari Mohan Prasad, *How to Prepare for Group Discussions and Interviews*, Tata McGraw Hill, 2006.