

## ENG 105 ENGLISH

2L + 1T + 0P + 2.5C

MM 100

**Module 1: Prose-** A Cup of Tea by Katherine Mansfield, The Piece of String by Guy De Maupassant, Text of Steve Jobs' Commencement address -2005.

**Poems:** Ode to the skylark – by P B Shelley, Where The Mind Is Without Fear – by Rabindranath Tagore, The Road Not Taken- Robert Frost.

**Module 2: Grammar & Vocabulary-** Tenses and the concept of time, Verb Types, Active and Passive Voice, Narration, Prepositions, Conditionals, Modal Auxiliaries, Conjunctions, One word substitutions, Synonyms and Antonyms.

**Module 3: Writing Skills-** Writing Paragraph, Essay, Writing Articles for Newspapers & Magazines, Writing Applications, Resumé Writing.

**Module 4: Reading Skills-** Reading Comprehension, Summarizing and Note making.

**Module 5: Speaking Skills-** Conversations- Introduction, Purpose, Features, Delivering Speeches- Welcome, Introductory, Vote of Thanks, Farewell Speech, Indianism.

### Text/Reference Books

1. Communication Skills, Pushp Lata & Sanjay Kumar, Oxford Higher Education/Oxford University Press.
2. Technical Communication; Principles and Practice, Meenakshi Raman & Sangita Sharma, Oxford University Press.
3. Effective Technical Communication, M Ashraf Rizvi, Tata Mcgraw Hill.

Semester I

B.Tech (Common to all branches)

**MAT 102 ENGINEERING MATHEMATICS-I**

3L + 1T + 0P + 3.5 C

MM 100

**Module 1: Differential Equation I-** Differential equations of first order and first degree - Linear differential equations, Reducible to linear form, Exact Form, Reducible to Exact Form, Linear Differential Equations of Higher Order with Constant Coefficients Only.

**Module 2: Differential Equation II-** Second order ordinary differential equations with variable coefficients- Homogeneous form, Exact form, Change of Dependent Variable, Change of Independent Variable, Normal form, Variation of Parameters.

**Module 3: Differential Calculus I-** Partial Differentiation, Euler's Theorem on Homogeneous Functions, Approximate Calculations, Maxima and Minima of two and more independent variables, Lagrange's Method of Multipliers.

**Module 4: Differential Calculus II-** Asymptotes (Cartesian co-ordinates only), Curvature, Concavity, Convexity and Point of Inflexion (Cartesian co-ordinates only), Curve Tracing (Cartesian and Standard Polar Curves).

**Module 5: Integral Calculus-** Area of Curves, Rectification, Surface and Volume of Solids of Revolution, Double and Triple Integrals, Double Integral by changing into polar form, Area and Volume by Double Integration, Change of Order of Integration, Beta Function and Gamma Function (Simple Properties).

**Text/Reference Books**

1. Higher Engineering Mathematics, B.V. Ramana, Tata McGraw Hill.
2. Advanced Engineering Mathematics, Erwin Kreyszig, Wiley 9<sup>th</sup> Edition
3. Calculus and Analytical Geometry, Thomas and Finney, Narosa Publishing House(New Delhi)
4. Integral Calculus, Shanti Narayan, S. Chand.
5. Differential Calculus, Shanti Narayan, S. Chand.
6. Ordinary and Partial differential equations, M. D. Raisinghania, S. Chand.
7. Calculus, Thomas & Finney, Narosa Publishing House(New Delhi).

Semester I

B.Tech (Common to all branches)

**PHY 105 PHYSICS FOR ENGINEERS –I**

3L + 1T + 0P + 3.5C

MM 100

**Module I: Basic Optics:** Reflection of light, Refraction of light, total internal reflection and its applications, Refraction and dispersion of light through a prism. Wave front and Huygens's principle, reflection and refraction of plane wave at a plane surface using wave fronts. Young's double slit experiment and expression for fringe width, coherent sources. Optical fiber as optical wave-guide. Numerical aperture and maximum angle of acceptance.

**Module II: Interference of Light:** Michelson's Interferometer: Production of circular & straight line fringes, Determination of wavelength of light. Determination of wavelength. Newton's rings and measurement of wavelength of light. Elementary idea of anti-reflection coating.

**Module III: Polarization of Light:** Plane circular and elliptically polarized light on the basis of electric (light) vector, Malus law. Double Refraction: Qualitative description of double refraction phase retardation plates, quarter and half wave plates, construction, working and use of these in production and detection of circular and elliptically polarized light. Optical Activity: Optical activity and law of optical rotation, specific rotation and its measurement using the bi-quartz device.

**Module IV: Diffraction of Light:** Single slit diffraction: Quantitative description of single slit, position of maxima / minima and width of central maximum, intensity variation. Diffraction Grating: Construction and theory. Determination of wavelength of light using plane transmission grating. Resolving power: Geometrical & Spectral, Raleigh criterion, Resolving power of diffraction grating.

**Module V: Coherence & Laser:** Spatial and temporal coherence, Coherence length, Coherence time and 'Q' factor for light. Temporal coherence and spectral purity, Theory of laser action: Einstein's coefficients, Components of a laser. Theory, Design and applications of He-Ne and semiconductor lasers.

**Text/Reference Books**

1. Optics, Ajay Ghatak, Tata McGraw Hill(Noida).
2. Optics, N. Subrahmanyam & Brij Lal, S. Chand (New Delhi).
3. Feynman Lectures on Physics, Volume I, II & III, Perseus Books Group California Institute of Technology.
4. Fundamental of optics, white & jenkins , Tata McGraw Hil.
5. Optics, Eugene Heceht, Schaum series.

Semester I

B.Tech (Common to all branches)

**CHY 105 CHEMISTRY FOR ENGINEERS**

2L + 0T + 0P + 2C

MM 100

**Module 1: Polymers and polymerization:** Introduction & Classification of polymers mechanism of polymerization (Addition, condensation and co-ordination) effect of structure on properties of polymers bio polymerization, bio degradable polymerization, preparation properties and technical application of thermo– plastics ( PVC, PVA, Teflon ) & thermo sets ( PF,UF ), natural elastomers and synthetic rubber ( SBR,GR –N ) ,silicones , introduction to polymeric composites.

**Module 2: Fuels:** Solid fuels: Coal, carbonization of coal, manufacturing of coke by Beehive oven and by product oven method. Liquid fuels: Advantages and refining of petroleum. cracking, refining, reforming, polymerization and isomerization of refinery products, Synthetic petrol( Coal to Liquid, CTL, Technology): Berguis and Fischer Tropsch process, knocking, octane number and anti-knocking agents, Ultimate and proximate analysis of coal, determination of solid and gaseous fuels by bomb and Junker's Calorimeter respectively. Combustion and requirement of oxygen/ air in combustion process, Flue gas analysis by Orsat's apparatus and its significance.

**Module 3:Cement:** Definition, composition, basic constituents and their significance, manufacturing of Portland cement by Rotary Kiln Technology, chemistry of setting and hardening of cement and role of gypsum.

**Refractories:** Definition, classification, properties, requisites of good refractory and manufacturing of refractory, detailed study of silica and fire clay refractory and their uses Seger's (Pyrometric) Cone Test and RUL Test.

**Module 4: Lubricants:** Introduction, classification and uses of lubricants, types of lubrication, viscosity & viscosity index flash and fire point, cloud and pour point, steam, emulsification number, precipitation number and neutralization number.

**Module 5:Corrosion:** Definition and its significance, mechanisms of corrosion: chemical(Dry) corrosion and electrochemical(Wet) corrosion. Protection from corrosion: protective coatings, cathodic protection, sacrificial anode and modification in designs etc.

**Text/Reference Books**

1. Engineering Chemistry, P.C.Jain and Monica Jain, Dhanpat Rai Pub, Co.(New Delhi).
2. A text book of Engineering Chemistry, S. S. Dara, S. Chand & Co.Ltd(New Delhi).
3. Chemistry in Engineering & Tech, Vol. I & II, Kuriacose, Tata McGraw-Hill.
4. Engineering Chemistry, B. Sivasankar, Tata McGraw-Hill Pub.Co.Ltd (New Delhi).
5. Engineering Chemistry, B. K. Sharma Krishna, Prakasan Media P. Ltd (Meerut).
6. Chemistry in Engineering and Technology, Kuriakose, J.C. and Rajaram J, Vol. I and II, Tata McGraw-Hill Publications Co.Ltd(New Delhi).

Semester I

B.Tech (Common to all branches)

**BEE 101 BASIC ELECTRICAL & ELECTRONICS**

3L + 1T + 0P + 3.5 C

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**Module 1: Basic Electrical Quantities** :-Basic concept of charge, current, voltage, resistance, power, energy and their units, Conversion of units of work, power and energy from one form to another. Electrical Energy: Difference between ac and dc and their applications ,Classification of two terminal elements ,Energy Sources , Source Transformation, ideal independent two terminal electrical sources.

**DC Networks:** Ohm's law, resistances, capacitances & inductors in series and parallel, Kirchhoff's laws and their applications in solving electrical network problems, Node Voltage and Mesh Current Analysis, Star-delta transformation.

**Module 2: Network theorems:** Thevenin Theorem, Norton Theorem and Superposition Theorem, Statement and applications including dependent sources.

**Transformer:** Faraday's Law of Electromagnetic Induction, Construction and Operation of Single Phase Transformer, EMF Equation, Voltage & Current Relationship and Phasor Diagram of Ideal Transformer.

**Module 3: AC Fundamentals:** Concept of alternating current and voltage, Generation of Single Phase AC Voltage, EMF Equation, Average, RMS and Effective Values Representation of alternating sinusoidal quantities by vectors, Phasor algebra (addition, subtraction, multiplication and division of complex quantities). RL, RC & RLC Series-Parallel Circuits, Complex Representation of Impedances, Reactance, Phasor Diagram, Power and Power Factor.

**Module 4: Review of Semiconductors:** Semiconductors, conductors and insulators, intrinsic and extrinsic semiconductors and conduction in semiconductors.

**Semiconductor Physics:** Basic material properties of semi-conductors, governing factors for Fermi-level, carrier concentration and carrier mobility, recombination and carrier lifetime, carrier drift, diffusion, Hall effect and continuity equation.

**Module 5: Junction Diodes:** Introduction, forward and reverse biasing of diode, voltage current characteristic of diode, diode models, half wave rectifier, full wave rectifier, Zener diode and its application.

**Bipolar Transistor:** Transistor structure, basic transistor operation, common base configuration and its characteristics, transistor amplifying action, common emitter configuration and its characteristics, common collector configuration, limit of operation, the dc operating point and biasing techniques (fixed bias, voltage divide bias, voltage feedback type, current feedback type, and combination of voltage and current feedback types)

**Text/Reference Books**

1. Integrated Electronics Analog and Digital Circuits & Systems, J. Millman & C.C. Halkias, McGraw Hill.
2. Electronic Devices and Integrated Circuits, B. P. Singh & Rekha Singh, Pearson Education.
3. Theory and problems of Basic Electrical Engineering, D.P. Kothari & I. J. Nagrath, PHI.
4. Basic Electrical Engineering, V.N. Mittal & A. Mittal, TMH.
5. Solutions of problems in Electrical Engineering, Smith Parker, CBS Publisher.
6. Electronics Devices & Circuit Theory, Boylestad & Nashelsky, Prentice Hall of India.

**BCS 101 FUNDAMENTALS OF COMPUTER**

3L + 0T + 0P + 3C

MM100

**Module 1:-**Brief history of development of computers, Computer system, concepts, Computer system characteristics, Capabilities and limitations, Types of computers Generations of computers, Personal Computer (PCs) – evolution of PCs, configurations of PCs- Pentium and Newer, PCs specifications and main characteristics. Basic components of a computer system - Control unit, ALU, Input/output functions and characteristics, memory - RAM, ROM, EPROM, PROM and other types of memory. Computer software and its types, Programming languages - Machine, assembly and high level, Language translators, Overview of the Digital Computer System - Processor, Memory, Input and Output Devices, Storage Devices, Operating Systems, Application Software, Types of Computers.

**Module 2:-**Input/Output& Storage Units:-Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, Scanners, Digital Camera, MICR, OCR, OMR, Bar-code Reader, Voice Recognition, Light pen, Touch Screen, Monitors - characteristics and types of monitor -Digital, Analog, Size, Resolution, Refresh Rate, Interlaced / Non Interlaced, Dot Pitch, Video Standard - VGA, SVGA, XGA etc, Printers& types - Daisy wheel, Dot Matrix, Inkjet, Laser, Line Printer, Plotter, Sound Card and Speakers

**Module 3:-**Software and its Need, Types of Software - System software, Application software, System Software - Operating System, Utility Program, Programming languages, Assemblers, Compilers and Interpreter, Introduction to operating system for PCs-DOS Windows, Linux, File Allocation Table (FAT & FAT 32), files & directory structure and its naming rules, booting process details of DOS and Windows, DOS system files.

**Internet Applications:** Internet, Internet Applications, e-Mail, IRC, Web Surfing, Web Browsers, Search Engines, Internet Service Providers, Downloading, Audio and Video Conferencing. Security issues in Internet – Bugs, Viruses, Anti-viruses, and Firewalls etc. Internet threats to the society, Cyber laws and Legal issues.

**Module 4:-**Use of communication and IT- Communication Process, Communication types- Simplex, Half Duplex, Full Duplex, Communication Protocols, Communication Channels - Twisted, Coaxial, and Fiber Optic. Serial and Parallel Communication, Modem - Working and characteristics, Types of network Connections - Dialup, Leased Lines, ISDN, DSL, Broad band ,Types of Network - LAN, WAN, MAN , VPN etc., Topologies of LAN - Ring, Bus, Star, Mesh and Tree topologies, Components of LAN - Media, NIC, NOS, Bridges, HUB, Routers, Repeater and Gateways. Internet: Evolution, World Wide Web Internet Services, Convergence of technologies.

**Module 5:-**Representation of Data: Digital versus Analog, Digital number system (binary, octal, decimal and hexadecimal numbers,), Conversion from one form to another, fractional numbers and signed numbers, Complements, Arithmetic operations on binary numbers, Fixed point and floating point representations. Boolean algebra (addition, subtraction, multiplication and division), Logic Gates (NOT, OR, AND, NAND, NOR, XOR, XNOR).

**Text/Reference Books**

1. Introduction to Computers, Leon & AlexisEtal, Vikas Publishing House
2. Fundamentals of Information Technology, Dr. Durgesh Pant & Mahesh Kumar Sharma, Laxmi Publication.
3. Introduction to Information Technology, V. Rajaraman, Prentice- Hall of India.
4. The C Programming language, Ritchie & Kernighan, PHI.
5. Computer Fundamentals and programming in C, Dey&Ghosh, Oxford.
6. Programming in C, Kamthane, Pearson.

Semester I

B.Tech (Common to all branches)

**PHY 106 PHYSICS FOR ENGINEERS LAB-I**

0L + 0T + 2P + 1C

MM 100

1. To determine the wavelength of sodium light by Newton's Ring.
2. To determine the wavelength of sodium light by Michelson Interferometer.
3. To determine coherent length and coherent time of laser using He-Ne Laser
4. To determine the specific rotation of Glucose (Sugar) solution using a Polari meter.
5. To determine the dispersive power of material of a prism for violet, red and yellow Color of Mercury light with the help of a spectrometer
6. To determine the wave length of prominent lines of mercury by plane diffraction grating with the help of spectrometer.
7. To determine and verify the dispersive power of the plane transmission grating
8. To measure the Numerical Aperture of an Optical Fiber
9. To study the production of PPL, CPL and EPL light
10. Verification of resolving power of a telescope.

Semester I

B.Tech (Common to all branches)

## CHY 106 CHEMISTRY LAB

0L + 0T + 2P + 1C

MM 100

### List of Experiments (any six)

1. To determine the viscosity of a given lubricating oil by Redwood viscometer.
2. To determine the flash and fire point of a given lubricating oil.
3. To determine cloud and pour point of a given oil.
4. Proximate analysis of solid fuel.
5. To determine the strength of Ferrous Ammonium sulphate solution with the help of  $K_2Cr_2O_7$  solution using internal indicator.
6. Determination of barium as barium sulphate gravimetrically
7. To determine the strength of  $CuSO_4$  solution with the help of hypo solution.
8. Preparation of standard solution of N/10, N/20 etc. (oxalic acid /hypo/ NaOH)
9. Prepare Mohr's salt or F.A.S. (Ferrous ammonium sulphate)
10. To estimate silver chloride ( $AgCl$ ) content in a given silver salt solution and then calculate the silver content.

### Text/Reference Books

1. Practical Engineering Chemistry, Dr.Sapna Dubey & Dr.Renu Gupta
2. Vogel's Textbook of Quantitative Chemical Analysis (Latest ed.), Revised by G.H. Jeffery, J. Bassett, J. Mendham & R.C. Denney
3. Applied Chemistry: Theory and Practice (Latest ed.), By O.P. Vermani & A.K. Narula



Semester I

B.Tech (Common to all branches)

**BEE 102 BASIC ELECTRICAL & ELECTRONICS LAB**

0L + 0T + 2P + 1C

MM 100

**Electrical Lab:**

1. To verify Ohm's Law
2. Verification of Kirchoff's Law applied to the DC circuits.
  - (a) Parallel and Series combination
  - (b) Identification of node points
  - (c) Algebraic sum of current at node points
  - (d) Algebraic sum of e.m.f.s and voltage drops.
3. To construct a RLC series circuit and measure its impedance, inductive ( $X_L$ ) and capacitive reactance ( $X_C$ ), measure phase angle between voltage and current.
4. Make house wiring including earthing for 1-phase energy meter, MCB, ceiling fan, tube light, three pin socket and a lamp operated from two different positions.
5. Study the construction & basic working of ceiling fan. Connect ceiling fan along with regulator through auto-transformer to run and vary speed.
6. Study the construction and connection of single phase transformer and auto-transformer. Measure input and output voltage and fin turn ratio.
7. Study the construction, circuit, working and application of the following lamps.
  - (a) Fluorescent Lamp, (b) Sodium Vapour Lamp (c) Mercury vapour lamp (d) Halogen Lamp

**Electronics Lab:**

1. Study the following devices:
  - (a) Analog & digital multimeters
  - (b) Function/ Signal generators
  - (c) Regulated d. c. power supplies (constant voltage and constant current operations)
  - (d) Study of analog CRO, measurement of time period, amplitude, frequency & phase angle using Lissajous figures.
2. Identification, testing and applications of Resistors, Inductors, Capacitors, PN-diode, SCR, TRIAC, Photo Diode, Zener diode, LED, LCD, BJT, Photo Transistor.
3. Plot V-I characteristic of P-N junction diode & Zener diode & calculate cut-in voltage, reverse Saturation current and static & dynamic resistances. Application of Diode as clipper & clamper.
4. Plot input and output characteristics of BJT in CE configurations. Find its h parameters. Plot gain- frequency characteristic of emitter follower & find out its input and output resistances.
5. Study half wave rectifier and bridge rectifier and effect of filters on wave. Also calculate theoretical & practical ripple factor.

Semester I

B.Tech (Common to all branches)

## BCS 102 FUNDAMENTALS OF COMPUTER LAB

0L + 0T + 2P + 1C

MM 100

### List of Practicals

1. Given a PC, name its various components and list their functions
2. Identification of various parts of a computer and peripherals
3. DOS Basic Commands
4. Exercises on entering text and data (Typing Practice)
5. Installation of Windows Operating System using pen- drive, CD & Virtual Machine
6. MS-WORD
  - a. File Management: Opening, creating and saving a document, locating files, copying contents in some different file(s), protecting files, giving password protection for a file
  - b. Page set up: Setting margins, tab setting, ruler, indenting
  - c. Editing a document: - Entering text, Cut, copy, paste using tool- bars
7. Work books:
  - a. Managing workbooks (create, open, close, save), working in work books, selecting the cells, choosing commands, data entry techniques, formula, creation and links, controlling calculations, working with arrays
  - b. Editing a worksheet, copying, moving cells, pasting, inserting, deletion cells, rows, columns, find and replace text, numbers of cells, formatting worksheet.
  - c. Creating a chart:-Working with chart types, changing data in chart, formatting a chart, use chart to analyze data
8. MS-Excel:-
  - a. How to change view of worksheet, outlining a worksheet, customize workspace, using templates to create default workbooks, protecting work book
  - b. Exchange data with other application: linking and embedding, embedding objects, linking to other applications, import, and export document.
9. Internet and its Applications
  - (a) Log-in to internet
  - (b) Navigation for information seeking on internet
  - (c) Browsing and down loading of information from internet
  - (d) Sending and receiving e-mail
  - Working with more than one window in MS Word,
  - How to change the version of the document from one window OS to another Conversion between different text editors, software and MS word
8. MS-EXCEL
  - Starting excel, open worksheet, enter, edit, data, formulas to calculate values, format data, create chart, printing chart, save worksheet, switching from another spread sheet
  - Menu commands- create, format charts, organise, manage data, solving problem by analyzing

Semester I

B.Tech (Common to all branches)

**BME 101 WORKSHOP PRACTICE**

**0L + 0T + 2P + 1C**

**MM 100**

**Carpentry Shop**

1. T – Lap joint
2. Cross lap joint

**Welding Shop**

1. Gas welding practice by students on mild steel flat
2. Lap joint by gas welding
3. Arc welding practice by students
4. Square butt joint by Arc welding

**Machine Shop Practice**

1. Job on lathe with one step turning and chamfering operations
2. Job on lathe with Facing and knurling operations
3. Drilling two holes of size 5 and 12 mm diameter on job used / to be used for shaping
4. Grinding a corner of above job on bench grinder

**Fitting Shop**

1. Finishing of two sides of a square piece by filing
2. To cut a square notch using hacksaw and to drill three holes on PCD and tapping

**Text/Reference Books**

1. Workshop Practice, K. C. JOHN, PHI Learning Pvt. Ltd.
2. Modern Workshop Technology, Henry Wright, BAKER Cleaver-Hume Press.
3. Workshop Technology, Hajra, Chaudhary, Media promotors & publishers pvt. Ltd.
4. Workshop Technology, B.S. Raghhuwanshi, Dhanpat Rai & Company (p) Limited.
5. Workshop Technology, Virendra Narula, Kataria & sons publications.
6. Comprehensive Workshop Technology, S.K. Garg, Laxmi Publications.

## BME 102 ENGINEERING GRAPHICS

0L + 0T + 2P + 1C

MM 100

**Sketch book preparation:** Introduction to Engineering Drawing, Prerequisite for Engineering Drawing, Drawing Instruments, Drawing Margins & title Block, Lettering, Type of lines, Dimensioning techniques, Scales: Types of scales, construction of Scales: plain Scales, Vernier Scales, Diagonal Scales, Comparative scales Engineering curves: Classification and application of Engineering Curves, Construction of Conics, Cycloidal Curves, Involute and Spirals along with normal and tangent to each curve.

**Sheet1: Projections of Point & Lines:** Introduction to principal planes of projections, Projections of the points located in same quadrant and different quadrants, Projections of line with its inclination to one reference plane and with two reference planes. True length and inclination with the reference planes.

**Sheet 2: Projections of planes:** Projections of planes (polygons, circle and ellipse) with its inclination to one reference plane and with two reference planes, Concept of auxiliary plane method for projections of the plane.

**Sheet 3: Projections of Solids and Section of Solids:** Classification of solids. Projections of solids (Cylinder, Cone, Pyramid and Prism) along with frustum with its inclination to one reference plane and with two reference planes. Section of such solids and the true shape of the section.

**Sheet 4: Orthographic Projection :** Fundamental of projection along with classification, Projections from the pictorial view of the object on the principal planes for view from front, top and sides using first angle projection method and third angle projection method, full sectional view

**Sheet 5: Isometric Projection:** Principle of Isometric Projection Isometric scale, Isometric projections and Isometric Views, Isometric Views of standard shapes, Isometric views of standard solids.

**Sketch book preparation:** Welded joints, riveted joints, lap joint, butt joint, screw fasteners, Screw threads.

**Computer Aided Drafting:** Introduction to CAD, Advantages of CAD software's, Auto CAD, Auto CAD Commands and tool bars, Creating the Drawing, Changing properties, Dimensioning other object, Text editing, Isometric drawing.

### Text/Reference Books

1. Engineering Drawing Geometrical Drawing, P.S.Gill , S.K.Katara & Sons.
2. Engineering Drawing, Dhanarajay A Jolhe, Tata McGraw Hill.
3. Engineering Drawing, Basant Agarwal & CM Agarwal, Tata McGraw Hill.
4. Engineering Drawing, N. D. Bhatt, Charotar Publishing House Pvt. Ltd.

Semester I

B.Tech (Common to all branches)

## ENG 113 Soft skills and Self Awareness

0L + 0T + 2P + 1C

MM 100

### 1. Self Awareness

What is Self Awareness?, Introspection, Guide to Self Awareness and Self Analysis, SWOT Analysis on self

### 2. Confidence Building

What is Confidence?, Important of Confidence Building, 6-steps guide on building Self – Confidence

### 3. Goal Setting

Purpose of Goal Setting, Importance of Goal Setting, SMART Goals, Performance Goals and Result Goals

### 4. Professional Grooming and Basic Etiquette

First Impressions, Importance of Professional Grooming, Grooming Guide – Men/ Women, Introduction to Basic Etiquette, Classroom Etiquette/Restroom Etiquette/Telephone Etiquette, General Etiquette

### 1. Sentence Formation

Using Noun/Types of Noun, Verbs & its usage, Tense chart using Verbs, Subject-Verb Agreement

### 2. Paragraph Writing

Three Essential Elements, Illustration & Application of the Three Elements, How to write an effective paragraph

### 3. Rapid Reading

What is Rapid Reading?, Importance of Rapid Reading, Simplifying Rapid Reading, Rapid Reading Passages

### 4. Public Speaking

Why is Public Speaking important?, Three parts to Public Speaking explained, Guide to successful Public Speaking

### 5. Time Management

What is Time Management?, Importance of Time Management, Managing Time Effectively, Blocks to Effective Time Management

### 6. Stress Management

Stress and its Causes, Symptoms of Unmanaged Stress, Managing Stress, Benefits of Stress Management

### 7. Presentation Skills

Types of Presentation Communication, A Beginner's Guide to PowerPoint 2013, 4 P's, Delivering Effective Presentation

### 8. The Colorful World of Adjectives

Types of Adjectives, Use of Adjective in Sentences, Descriptive Adjective for You.

### Text/Reference Books

1. Business communication Design, Angell, Pamela, Mcgraw-Hill, New York.
2. Grammar Finder, Eastwood, John, Oxford university press.
3. Effective technical communication, Mitra, K. Barun, Oxford university press.
4. Communicate to conquer: A handbook of group discussion and interviews, PHI learning, New Delhi.

Semester II

B.Tech (Common to all branches)

## ENG 106 PROFESSIONAL ENGLISH

2L + 1T + 0P + 2.5C

MM 100

**Module 1: Fundamentals of Communication-** Introduction, Definition, Process, Importance, Different Forms and Purpose of Communication, Barriers to Communication, Organizational and Interpersonal Communication

**Module 2: Group Discussion-** Introduction to Group Discussion, Types, Roles and Functions in Group Discussion, Difference between GD and Debate, Preparation Strategy, Tips for a good GD.

**Module 3: Presentation-** Fundamentals of Presentation, Audience Analysis, Organizing Material, Visual Aids and Nuances of Delivery, Body language and Effective Presentation, Question- Answer Session

**Module 4: Professional Writing-** Official Correspondence – Drafting E- mails, Memorandum, Notice, Agenda, Minutes, Circulars, Business Correspondence- Business letter writing- Sales letters, Enquiry letters and replies to enquiry (enquiry about a product, service or information, asking for a quotation, placing an order and replies to the same) letters of Claim and Adjustment

**Module 5: Technical Writing-** Report Writing- General and Technical report, Definition, Types, structure, Technical proposals- Definitions, Types and Format

### Text/Reference Books

1. Communication Skills, Pushp Lata & Sanjay Kumar. Oxford Higher Education/Oxford University Press.
2. Technical Communication; Principles and Practice, Meenakshi Raman & Sangita Sharma, Oxford University Press.
3. Effective Technical Communication, M Ashraf Rizvi, Tata McGraw-Hill Education
4. Basic Communication Skills for Technology, Andrea J. Rutherford, Pearson Education Asia

Semester II

B.Tech (Common to all branches)

**MAT 103 ENGINEERING MATHEMATICS II**

3L + 1T + 0P + 3.5C

MM 100

**Module 1: Matrices-** Rank of a matrix, Rank of matrix by reducing to normal forms, Consistency and redundancy of systems of simultaneous linear equations and its solution, Eigen values and Eigen vectors, Cayley- Hamilton theorem (without proof), Diagonalization of matrix.

**Module 2: Differential Equations-** Series Solutions of Second Order Linear Differential Equations with Variable Coefficients (complementary functions only), Partial Differential Equations of First Order : Lagrange's Form, Standard Forms, Charpit's Method .

**Module 3: Coordinate Geometry of Three Dimensions-** Equation of a sphere, Intersection of a sphere and a plane, tangent plane, Intersection of two spheres, orthogonality of two spheres, Right circular cone, Right circular cylinder.

**Module 4: Vector Calculus-** Scalar and vector fields, Differentiation and Integration of vector functions, Directional derivatives, Gradient, Divergence and Curl.Line, Surface and volume Integrals.Green's theorem in a plane, Gauss's and Stoke's theorem(without proof) and their applications

**Module 5: Statistics and Probability-** Elementary theory of probability, Baye's theorem with simple applications, theoretical probability distributions: Binomial, Poisson and Normal.

**Text/Reference Books**

- 1: Analytic Solid Geometry, Shanti Narayan (S.Chand).
- 2: Advanced Engineering Mathematics, Erwin Kreyszig, Wiley 9<sup>th</sup>Edition.
- 3: Mathematics for Engineers, Chandrika Prasad, Prasad Mudranalaya Allahabad.
- 4: Advanced Mathematics for Engineers, Chandrika Prasad, Prasad Mudranalaya.
- 5: Vector Analysis, M.D.Raisinghanian (S.Chand).
- 6: Advanced Engineering Mathematics, Jain and Iyenger, Narosa.
- 8: Probability,Statistics and Queueing theory:Allen.
- 9: Statistical Methods (Vol. I & II), N.G.Das, TMH.
- 10: Schaum's Outline Series for Vector Calculus.
- 11: Schaum's Outline Series for Matrices.
- 12: Engineering Mathematics-II by C.B. Gupta and A .K. Malik, New Age International Pvt. Ltd.
- 13: Higher Engineering Mathematics, B.V.Ramana, Tata McGraw Hill.14: Probability, Statistics and Queueing theory, V.Sundrapandian, PHI.

**PHY 107 PHYSICS FOR ENGINEERS -II**

3L + 1T + 0P + 3.5C

MM 100

**Module I: Special Theory of Relativity:** Postulates of special theory of relativity, Lorentz transformations, Relativity of length, mass and time. Relativistic velocity addition, mass-energy relation. Relativistic Energy and momentum.

**Module II: Quantum Mechanics:** Compton Effect & quantum nature of light. Schrodinger's Wave Equation: Time dependent and time independent cases. Physical interpretation of wave function and its properties, boundary conditions.

**Applications of Schrodinger's Equation:** Particle in one-dimensional box. Particle in three-dimensional boxes. Degeneracy, Barrier penetration and tunnel effect, Alpha Decay.

**Module III: Metals and Superconductors: Summerfield's Free electron gas model:** Postulates, Density of energy states, Fermi energy level, Band Theory of solids.

**Superconductivity:** Qualitative study of the phenomenon-meissner's effect-Josephson effect Type I & II super conductor.

**Module IV: Electro Dynamics:** Scalar and Vector fields, Definitions of gradient Divergence and curl, Maxwell's Equations.

**Module V: Nuclear Radiations Detector:** - Nuclear radiations detector: Principle of Gas filled detector. Proposal counter, G M counter, Scintillation counter.

**Text/Reference Books**

1. Concept of Modern Physics, Arthur Beiser, Tata McGraw Hill (Noida).
2. Introduction to Solid State Physics, C. Kittel, Wiley Editions(New Delhi).
3. Introduction to Electrodynamics, John D. Griffith, Tata McGraw Hill(Noida).
4. Electromagnetics, Sadiku, Oxford university Press(New Delhi).
5. QuantumMechanics, Ghatak & Loknathan, Tata McGraw Hill (Noida).



**CHY 103 ENVIRONMENTAL SCIENCE**

2L + 0T + 0P + 2C

MM 100

**Module 1: Introduction and natural resources:** Multidisciplinary nature and public awareness, renewable and non renewable resources and associated problems, forest, water, mineral, food, energy and land resources. Introduction to natural resources, conservation of natural resources and human role.

**Module 2: Ecosystem:** Ecological concepts, concept of ecosystems, types of ecosystems, ecosystem structure and functioning, energy flow, food chains and food webs, ecological pyramids.

**Module 3: Biodiversity and Conservation:** Definition, genetic species and ecosystem diversity biogeographically, classification of Indian value of biodiversity at national and local levels, India as a mega-diversity nation, treats to biodiversity and endangered and endemic species of India, need for conservation of biodiversity.

**Module 4: Environmental pollution:** Definition, causes, effect and control of air pollution, water pollution, soil pollution, marine pollution, noise pollution, thermal pollution, electromagnetic pollution, nuclear hazards, human role in prevention of pollution, solid waste management, disaster management, floods, earthquake, cyclone, and landslide

**Firework Safety:** Combustion of firework and pollution (noise, smoke, fireworks fallout and residue pollution), heavy metal toxicity due to fireworks and associated health effects.

**Module 5: Social Issue and Environment:** Unsuitable to suitable development, urban problem related to energy and water conservation, environment protection act, wild life protection act, forest conservation act, environmental issues, population explosion, and family welfare programme. Environmental and human health HIV, women and child welfare, role of information technology on environment and human health.

**Corruption:** definition and reasons, details of organizations/agencies working against corruption, role of individual against corruption and mode of action.

**Ethics :** Meaning, nature, determinants and objectives of ethics, ethics and its relation to values norms and morals, Indian ethos, Swami Vivekananda and ethics.

**Text/Reference Books**

1. Fundamentals of Environmental Biology, K. C. Agrawal, Nidhi Publishers(Bikaner).
2. Fundamentals of Ecology, E.P. Odum, W.B. Saunders Co. (USA).
3. Fundamentals of Ecology, E. P. Odum, Natraj Publisher (Dehradun).
4. Ecology: Principles and Applications, J. L. Chapman & , M. J. Reiss, Cambridge University Press.
5. Atmospheric pollution, W. Buch, Tata McGraw Hill(TM)
6. Professional Ethics and Human Values, M. Govindarajan, PHI Learning Private Limited (Delhi).
7. Corruption and Reform in India, Jennifer Bussell, Cambridge University Press.

Semester II

B.Tech (Common to all branches)

**BME 201 ENGINEERING MECHANICS**

3L + 1T + 0P + 3.5C

MM 100

**Module 1:** Fundamental laws of mechanics, Principle of transmissibility, System of forces, Resultant force, Resolution of force, Moment and Couples, Varignon's Theorem, Resolution of a force into a force and a couple, Free body diagram, Equilibrium, Conditions for equilibrium, Lami's theorem. Virtual work: Principle of Virtual Work, Active forces and active force diagram.

**Module 2:** Centroid & Moment of Inertia: Location of centroid and center of gravity, Moment of inertia, Parallel axis and perpendicular axis theorem, Radius of gyration, M.I of composite section, Polar moment of inertia, M.I of solid bodies(Mass moment of Inertia). Lifting Machines: Mechanical advantage, Velocity Ratio, Efficiency of machine, Ideal machine, Ideal effort and ideal load, Reversibility of machine, Law of machine, Lifting machines; System of Pulleys, Simple wheel and axle, Wheel and differential axle, Weston's differential pulley block, Worm and worm wheel, Single purchase winch crab.

**Module 3:** Friction: Types of Friction, Laws of friction, Angle of friction, Angle of repose, Ladder, Wedge, Belt Friction. Drives: Belt drives, Chain drives and Gear drives.

**Module 4:** Kinematics of Particles and Rigid Bodies: Velocity, Acceleration, Types of Motion, Equations of Motion, Rectangular components of velocity and acceleration, Angular velocity and Angular acceleration, Radial and transverse velocities and accelerations, Projectiles motion on plane and Inclined Plane, Relative Motion. Kinetics of Particles and Rigid Bodies: Newton's laws, Equation of motion in rectangular coordinate, radial and transverse components, Equation of motion in plane for a rigid body, D'Alembert principle.

**Module 5:** Work, Energy and Power: Work of a force, weight, spring force and couple, Power, Efficiency, Energy, Kinetic energy of rigid body, Principle of work and energy, Conservative and Nonconservative Force, Conservation of energy. Impulse and Momentum: Linear and angular momentum, Linear and angular impulse, Principle of momentum for a particle and rigid body, Principle of linear impulse and momentum for a particle and rigid body, Principle of angular momentum and Impulse, Conservation of angular momentum, Angular momentum of rigid body.

**Text/Reference Books**

1. Vector Mechanics for Engineers, Beer and Johnston, Tata McGraw-Hill.
2. Engineering Mechanics, Hibbeler, Pearson Education.
3. Engineering Mechanics, Meriam and Kraige, John Wiley & Sons.
4. Engineering Mechanics, Timoshenko and Young, Tata McGraw-Hill.
5. Engineering Mechanics, Shames, Pearson Education.
6. Engineering Mechanics, Boresi and Schmidt, CL-Engineering.
7. Engineering Mechanics, Andrew Pytel & Kiusalas, Cengage Learning.

**BCS 201 COMPUTER PROGRAMMING USING C**

3L + 0T + 0P + 3C

MM 100

**Module 1: Introduction:-**What is a program? What is a programming language? Steps in Programming, Skills needed to do programming, A little introduction to C, Writing a Program, Fundamentals of a Programming Language, Different Programming Techniques, Procedural Programming, Modular Programming, Object Oriented Programming, Getting started with compiler. Words and Sentences in C Language: Alphabets in C, Keywords in C, Rules of forming Words in C language, Data Variables, Data Types and Rules for naming and declaring data, variables, Basic Data Types in C, Constants, Comments in C.

**Module 2: Instructions and Rules for Writing:-**Types of instructions, Data Manipulation Instructions, Input/Output Instructions, Flow Control Instructions: Decision Control Instructions, If, if-else, If-else-if, Nested if-else, Loop Control Instructions, For Loop, While Loop, Do While, Selection Instructions.

**Module 3: Functions:-**Why use Functions, Components of Function, Name of a function, Body of a function, Local variables of a function, Parameters or Arguments to a function, Return Values, Prototype of a function

**Arrays:** What is an array? Array Declaration, Array Initialization, Accessing individual elements of an array, Two Dimensional Arrays, Passing an array element to a function, Rules of using an array.

**Module 4: Pointers:-**What is a pointer? Declaring a Pointer variable, initializing a pointer variable, Using a Pointer Variable, Pointer Arithmetic, Pointers and array, passing an entire array to a function.

Strings: What are strings? String I/O, String Manipulation Functions.

**Module 5: Structures:-**Declaring and Accessing Structure, variables Uses of Structures, Unions Storage Classes and Scoping: Automatic, Register, External, Static, Scope of a Variable File Input/Output: Command-line arguments, File Input and Output, Combining Command-line Arguments and File I/O.

**Text/Reference Books**

1. The C Programming Language, Brian W. Kernighan, Dennis M. Ritchie, Prentice-Hall (New Delhi).
2. C Programming: A Modern Approach, K. N. King, Prentice-Hall (New Delhi).
3. C Primer Plus, Stephen Prata, Sams.
4. Practical C Programming, Steve Oualline, O'Reilly Media.
5. Let us C, Yashwant Kanetkar, BPB Publications.
6. Pointers in C, Yashwant Kanetkar, BPB Publications.

**ENG 107 COMMUNICATION TECHNIQUES LAB**

0L + 0T + 2P + 1C

MM 100

1. Phonetic Symbols and Transcriptions
2. Methods of Word Formation
3. Reading, Listening and Speaking Skills
4. Seminar Presentation
5. Group Discussion
6. Job Interview

**Text/Reference Books**

1. Advanced Manual for Communication Laboratories and Technical Report Writing, D.Sudha Rani, Pearson,(New Delhi)
2. A Course in Phonetics and Spoken English, J. Sethi & P.V. Dhamija, PHI Learning Pvt. Ltd.
3. English Language Laboratories: A Comprehensive Manual, Nira Konar, PHI Learning Pvt. Ltd.
4. Oxford English Learning Package ( with CDs: Headway Series)
5. Tata McGraw Hills English Learning Package ( with CDs)
6. Oxford Advanced Learners' Dictionary, Oxford University Press (New Delhi)

**PHY 108 PHYSICS FOR ENGINEERS LAB-II**

0L + 0T + 2P + 1C

MM 100

1. To study the charging and discharging of a condenser and hence determine time Constant (both current and voltage graphs are to be plotted).
2. To determine the high resistance by method of leakage, using a Ballistic Galvanometer.
3. To study the variation of semiconductor resistance with temperature and hence determine the band gap of semiconductor in the form of reverse biased P-N junction diode.
4. To determine the ferromagnetic constants retaintivity, coercivity, permeability, susceptibility by tracing I.H. curve using C.R.O.
5. Frequency Determination - Melde's Method.
6. To determine the specific resistance of the material by Carey Foster Bridge.
7. To convert a Galvanometer in to an ammeter of given range and calibrate it.
8. To convert a Galvanometer in to a voltmeter of given range and calibrate it.

Semester II

B.Tech (Common to all branches)

**CHY 107 ENVIRONMENTAL SCIENCE LAB**

0L + 0T + 2P + 1C

MM 100

**List of Experiments(any six)**

1. To determine the hardness of water by HCl method.
2. To determine the hardness of water by EDTA method.
3. To determine pH of a given sample by pH-meter.
4. To determine conductivity of a given sample by conductivity -meter.
5. Determination of Dissolved Oxygen present in given water sample.
6. To determine the percentage of available chlorine in a given sample of bleaching powder.
7. To determine the dissolved ammonia in given sample water
8. Determine the dissolved carbon dioxide of a given sample of water
9. To determine the strength of Ferrous Ammonium sulphate solution with the help of  $K_2Cr_2O_7$  solution using external indicator.
10. To measure the extent of chloride ions present in given water sample.

**Text/Reference Books**

1. Practical Engineering Chemistry, Dr. Sapna Dubey & Dr.Renu Gupta.
2. Environmental Chemistry, Baird, 5thEdition, W.H. Freeman.
3. Laboratory manual for Environmental Chemistry, Sunitha Hooda, Sumanjeet Kaur.
4. Vogel's text book of quantitative Chemical Analysis Sixth edition, J Mendham, R C Denney, J D Barnes, M J K Thomas.
5. A Comprehensive Laboratory Manual for Environmental Science and Engineering, P. R Sreemadhavan Pillai.
6. Engineering Chemistry, Jain & Jain.

Semester II

B.Tech (Common to all branches)

**BCS 202 COMPUTER PROGRAMMING USING C LAB**

0L + 0T + 2P + 1C

MM 100

**Basic Calculation:****Basic Calculation:**

1. Write a c program to display your Name, address and city in different lines.
2. Write a c program to perform all arithmetic operations.
3. Write a c program to convert the Fahrenheit into centigrade. Formula  $c = (F-32)/1.8$
4. Write a c program to calculate the simple interest.
5. Write a c program to calculate the compound interest.
6. Write a program in C to display sum of first N natural numbers.
7. Write a c program to find the roots of the quadratic equation.

**Conditional Statements**

1. Write a C – program which used to determine type of triangle based on sides. Measure of sides input by the user. To check whether the triangle is isosceles, scalene or equilateral triangle. Hint: If all the sides are equal than equilateral, If any two sides are equal than isosceles otherwise scalene.
2. Write a program in C to which allow user to enter any arithmetic operator (+ - \* /) and two integer values and display result according to selection of operator.
3. Write a program in C to calculate gross salary of employee using : 1. Gross Salary = Basic Pay + DA + HRA – PF. 2. DA = 30% If Basic Pay < 5000 otherwise DA = 45% of the Basic Pay. 3. HRA = 15% of Basic Pay. 4. PF = 12% of Basic Pay. Only basic pay will input by the user. Display Gross salary – DA – HRA – PF and basic salary
4. Student should fulfill the following criteria for admission: Mathematics  $\geq 50$  Physics  $\geq 45$  Chemistry  $\geq 60$  Total of all subject  $\geq 170$  OR Total of Mathematics + Physics  $\geq 120$  Accept the marks of all the three subjects from the user and check if the student is eligible for admission.
5. Write a program in C for grade calculation using if...else if ladder and switch Statement. Accept marks of 3 subjects calculate total and based on it calculate Grade.

**Loop Programs**

1. Program to display first N prime numbers. N is input by the user.
2. Program to display A to Z in upper case or lower case according to user selection.
3. Program which used to print A to Z and Z to A.
4. Program which ask for party to user until the user say yes (Using While)
5. Program which ask for party to user until the user say yes (Using Do While)
6. Program which check that whether the given number is palindrome or not.
7. Program to check that the given number is Armstrong or not.
8. Program which will display next nearest prime number of given integer number. For example next nearest prime of 5 is 7, for 8 is 11, for 7 is 11 (Using Do while)

**BME 202 COMPUTER AIDED GRAPHICS**

0L + 0T + 2P + 1C

MM 100

**Introduction:** Principles of drawing, conventional representation of machine components and materials, lines, types of lines, dimensioning types, rules of dimensioning, Computer aided drafting: Introduction to computer aided drafting, advantages and applications of CAD, concepts of computer aided drafting using AutoCAD, basic drawing and modify commands.

[Discuss on AutoCAD software and to draw in Sketch book]

**Isometric Projections:** Isometric projection of planes and solids.

[At least 3 Problems in AutoCAD and 3 problems in Sketch book]

**Orthographic Projection:** Introduction to orthographic projection, concept of first angle and third angle projection, drawing of simple machine elements in first angle projection.

[At 4 problems on AutoCAD and 4problems in sketch book]

**Section of solids:** Introduction to sectional views, Section of right solids by normal and inclined planes.

[At least 2 problems on AutoCAD and 2problems in sketch book]

**Conventional representation of materials:** Common features, Springs, Gear Assemblies, Materials, Interrupted views and Braking of Shaft, Pipe, Bar, Surface finishing & Machining Symbols

[At least 2 problems on AutoCAD and 2 problems in sketch book]

**Miscellaneous:** Welded joints, riveted joints, Belt and pulleys, screw fasteners, Bearings; Ball, roller, needle, foot step bearing Belt and pulleys, pipe joints.

[At least one problem from each on AutoCAD and sketch book preparation of all topics]

**Text/Reference Books**

1. N.D. Bhatt, Elementary Engg. Drawing, Chartor Pub. House, Anand, India.
2. D. N. Johle, Engineering Drawing, Tata Mcgraw-hill Publishing Co. Ltd..
3. P.S. Gill, Engineering Graphics.
4. N.D. Bhatt, Machine Drawing, Chartor Publishing house, Anand, India.
5. Warren J. Luzzader, Fundamentals of Engineering Drawing, Prentice Hall of India, New Delhi.
6. Fredderock E. Giesecke, Alva Mitchell & others, Principles of Engineering Graphics, Maxwell McMillan Publishing.



## ENG 114 SOFT SKILLS AND COMMUNICATION

0L + 0T + 2P + 1C

MM 100

### 1. Communication for Impact

Importance and Types of Communication, 6 Steps Model of Communication, Guide to Effective Communication – Listening Skills, Successful Communication at Workplace.

### 2. Interpersonal Relationship Management

Importance of Interpersonal Relationship (IPR), Benefits of IPR, Developing Interpersonal Abilities.

### 3. Team Building

Definition and Types, Team work skills, Qualities of a Team Player.

### 4. Leadership

Understanding the qualities of a Good Leader, 4 Factors of Leadership, Bring out the Leader in You.

### 5. Resume Writing

Concepts of Resume, Curriculum Vitae and Bio-data, Resume – Information and Details, Sample Resume and Template.

### 6. Cover Letter

Cover letter Writing, Sample Cover letter and Template.

### 7. Personal Grooming and Interview Etiquette

Basic Personal Hygiene, Professional Attire – Men, Professional Attire – Women, Interview Etiquette Guide.

### 8. Telephonic Interview

Importance and Preparation, Advantages and Disadvantages, Things to Remember.

### 9. Video Interview

Preparation and Practice, Guide to a Successful Video Interview.

### 10. Group Discussion

Group Discussion Guide, Topics for Group Discussion, Mock GD.

### 11. Personal Interview

Importance and Types of Personal Interviews, FAQs with Answers.

### 12. Extempore

Guide to a Successful Extempore, Extempore Topics.

### Text/Reference Books

1. Business communication Design, Angell, Pamela, Mcgraw-Hill, New York.
2. Grammar Finder, Eastwood, John, Oxford university press.
3. Effective technical communication, Mitra, K. Barun, Oxford university press.
4. Communicate to conquer: A handbook of group discussion and interviews, PHI learning, New Delhi.