Scheme of Instruction & Syllabi
of
Bachelor of Technology
(Computer Science and Engineering)
With specialization in Cloud Computing
(With effect from academic session 2023-24)

(Dr. Gaurav Agarwal)   **(Prof. R.K. Shukla)**
 HOD CSE   **Dean Engineering & Technology**

(Prof. Y D S Arya)
Vice- Chancellor

Department of Computer Science and Engineering
INVERTIS UNIVERSITY
Invertis Village, Bareilly-Lucknow NH-24, Bareilly,
243123 U. P.

INVERTIS UNIVERSITY BAREILLY

Established by Govt. of U.P. u/s 2F of UGC Act, 1956 vide U.P. Act 22 of 2010.

STUDY AND EVALUATION SCHEME
(With effective from academic session 2023-2024)
B. Tech. in Computer Science & Engineering with specialization in Cloud Computing
YEAR I, SEMESTER I

Sl. No.	Category	Course Code	Course Title/ Subjects	Hours per week			Evaluation Scheme		Total	Credits
				L	T	P	CA	EE		
THEORY										
1	Ability Enhancement	ENG105	English	2	1	0	25	50	75	3
2	Science	MAT 102	Engineering Mathematics-I	3	1	0	30	70	100	4
3	Science	PHY 105	Physics for Engineers–I	3	1	0	30	70	100	4
4	Engineering	BEE 101	Basic Electrical and Electronics	3	1	0	30	70	100	4
5	Engineering	BCSI101	Problem Solving and Programming in C	3	0	0	25	50	75	3
6	Engineering Science Course	IIOT1	Fundamentals of IOT Development	4	0	0	30	70	100	4
PRACTICALS AND PROJECTS										
6	Science	PHY 106	Physics for Engineers Lab–I	0	0	2	10	15	25	1
7	Engineering	BEE 102	Basic Electrical and electronics lab	0	0	2	10	15	25	1
8	Engineering	BCSI102	Problem solving and Programming in C lab	0	0	2	10	15	25	1
9	Engineering	BME101	Workshop practice	0	0	2	10	15	25	1
10	Engineering	BCSI103	IT Workshop	0	0	2	10	15	25	1
11	Skill Enhancement	ENG 113	Soft Sills and Self Awareness	0	0	2	10	15	25	1
			Total	**18**	**4**	**12**	**230**	**470**	**750**	**28**

L-Lecture, **T-** Tutorial , **P**- Practical ,**CA**- Continuous Assessment, **EE-** End Semester Examination

[Revised after the inclusion of Skill and Entrepreneurship Courses effective from the session 2022-23]

INVERTIS
UNIVERSITY BAREILLY
Established by Govt. of U.P. u/s 2F of UGC Act, 1956 vide U.P. Act 22 of 2010.

STUDY AND EVALUATION SCHEME
(With effective from academic session 2023-2024)
B. Tech. in Computer Science & Engineering
with specialization in Cloud Computing
YEAR I, SEMESTER II

Sl. No.	Category	Course Code	Course Title/ Subjects	Hours per week L	T	P	Evaluation Scheme CA	EE	Total	Credits
THEORY										
1	Ability Enhancement	ENG106	Professional English	2	1	0	25	50	75	3
2	Science	MAT103	Engineering Mathematics–II	3	1	0	30	70	100	4
3	Science	PHY107	Physics for Engineers–II	3	1	0	30	70	100	4
4	Science	CHY103	Environmental Science	2	0	0	15	35	50	2
5	Engineering	BCSI201	Design Thinking	3	0	0	25	50	75	3
6	Engineering	BCSI202	Web Designing	3	0	0	25	50	75	3
7	Engineering Science Course	IIOT2	Industrial Communication Protocols & Connectivity	4	0	0	30	70	100	4
PRACTICALS AND PROJECTS										
7	Ability Enhancement	ENG107	Communication Techniques lab	0	0	2	10	15	25	1
8	Science	PHY108	Physics for Engineers lab –II	0	0	2	10	15	25	1
9	Engineering	BCSI203	Web Designing lab	0	0	2	10	15	25	1
10	Engineering	BCSI204	Computer Aided Graphics	0	0	2	10	15	25	1
11	Skill Enhancement	ENG114	Soft Skills and Communication	0	0	2	10	15	25	1
12	Skill Enhancement	SEP200	Extra-curricular Activity (NSS/NCC/Scouting/ Club Activity)	0	0	2	10	15	25	1
			TOTAL	20	3	12	240	485	725	29

L-Lecture, **T-** Tutorial , **P**- Practical ,**CA**- Continuous Assessment, **EE-** End Semester Examination

[Revised after the inclusion of Skill and Entrepreneurship Courses effective from the session 2022-23]

ENG 105: ENGLISH

Unit 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.

Unit 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.

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

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

Unit 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.

MAT 102: ENGINEERING MATHEMATICS-I

Unit 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.

Unit 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.

Unit 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.

Unit 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).

Unit 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 9th 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).

PHY 105: PHYSICS FOR ENGINEERS –I

Unit 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.

Unit 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.

Unit 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.

Unit 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.

Unit 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. Subrahnmanyam & 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.

BEE 101: BASIC ELECTRICAL AND ELECTRONICS

Unit 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.

Unit 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.

Unit 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.

Unit 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.

Unit 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 & Nashelskey, Prentice Hall of India.

BCSI101: Problem Solving and Programming in C

Unit 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.

Unit 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.

Unit 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.

Unit 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.

Unit 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.

PHY106: PHYSICS FOR ENGINEERS LAB–I

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.

INVERTIS

UNIVERSITY BAREILLY
Established by Govt. of U.P. u/s 2F of UGC Act, 1956 vide U.P. Act 22 of 2010.

BEE 102: BASIC ELECTRICAL AND ELECTRONICS LAB

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,TRAIC, 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.

BCSI102: Problem Solving and Programming in C

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 >= 50 Physics >= 45 Chemistry >= 60 Total of all subject >= 170 OR Total of Mathematics + Physics >= 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
5. Program which ask for party to user until the user say yes
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 101: WORKSHOP PRACTICE

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

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

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.

BCS1103: IT WORKSHOP

List of Practical

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, organize, manage data, solving problem by analyzing

ENG 113: Soft skills and Self Awareness

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.

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

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

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

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.

ENG 106: PROFESSIONAL ENGLISH

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

Unit 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.

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

Unit 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

Unit 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, Peerson Education Asia

MAT 103: ENGINEERING MATHEMATICS II

Unit 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.

Unit 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.

Unit 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.

Unit 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

Unit 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[th]Edition.
3: Mathematics for Engineers, Chandrika Prasad, Prasad Mudranalaya Allahabad.
4: Advanced Mathematics for Engineers, Chandrika Prasad, Prasad Mudranalaya.
5: Vector Analysis, M.D.Raisinghania (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

Unit 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.

Unit 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.

Unit 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.

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

Unit V: Nuclear Radiations Detector: - Nuclear radiations detector: Principle of Gas filled detector. Proposnal 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

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

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

Unit 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.

Unit 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.

Unit 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.

<u>**Text/Reference Books**</u>
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(TMH)
6. Professional Ethics and Human Values, M. <u>Govindarajan</u>, PHI Learning Private Limited (Delhi).

7. Corruption and Reform in India, Jennifer Bussell , Cambridge University Press.

INVERTIS
UNIVERSITY BAREILLY
Established by Govt. of U.P. u/s 2F of UGC Act, 1956 vide U.P. Act 22 of 2010.

BCSI201: DESIGN THINKING

Course Objectives:

- The human centered design process focuses on understanding and empathizing with the users and the context, and then on defining the users' needs in an actionable way.

- After developing a design paradigm, the process engages the first of many cycles of rapid experimentation, prototyping, and testing with users to drive the evolution of a solution that most effectively satisfies user's needs.

Course Outcomes:

Understand how teaching and learning occurs in the design process

- Recognize the ethical and social dilemmas and obligations of the practice of design

- Diagnose common adoption barriers in individuals, groups and organizations.

- Develop a design theory from independent and qualitative research and observations.

- Participate in and lead innovation in creative and collaborative settings

- Undertake complex and unstructured problem-solving challenges in unfamiliar domains

Unit I: Design Thinking

Foundations of Human Centered Design, Barriers to Innovation and Adoption, Learning by Doing, Understanding Needs in Context.

Unit II: Design Needs and Interventions

The Ethics of Design Interventions, Design Needs in Education, Engineering and Health & Society.

Unit III: Empathy in Design

Discovering Explicit and Latent Needs, Qualitative Research: Watching and Listening, Point of View & Problem Reframing, Developing Grounded Theory, Design for Usability

Unit IV: Ideation, Experimentation and Evolution

Generating and Developing Ideas, Creativity as Teaching and Learning, Prototyping and testing Learning Through Things & Interactions, Express, Test, Cycle

Unit V: Design Documentation

Representing Design Knowledge, Diffusion of Innovation, Design as research

Textbooks:

1. Design Thinking: Integrating Innovation, Customer Experience, and Brand Value,byThomas Lockwood,Allworth Press, 2010.

2. 101 Design Methods: A Structured Approach for Driving Innovation in Your Organization Book by Vijay Kumar.

Reference Books:

1. Design Thinking: Understand – Improve – Applyedited by Hasso Plattner, Christoph Meinel, Larry Leifer, Springer Science & Business Media, 2010

*Latest editions of all the suggested books are recommended.

BCSI202: Web Designing

UNIT I

Introduction to the Internet   and the World Wide Web

Introduction, History of internet, Internet Design Principles, Internet Protocols - FTP, TCP/IP, SMTP, Telnet, etc., Client Server Communication, Web System architecture

Evolution of the Web, Web architectures, Web clients and servers, Static and Dynamic Web Applications, Front end and back end web development. HTML, CSS, JS, XML; HTTP, secure HTTP, etc; URL, Web Services – SOAP, REST.

UNIT II
HTML & CSS

Introduction to Html, Html Document structure, Html Editors, Html element/tag & attributes, Designing simple page - Html tag, Head tag, Body tag; More Html tags - Anchor tag, Image tag, Table tag, List tag, Frame tag, Div tag ; Html forms - Input type, Text area, Select , Button, Images.

Introduction to CSS, Syntax, Selectors, Embedding CSS to Html, Formatting fonts, Text & background colour, Inline styles, External and Internal Style Sheets, Borders & boxing.

UNIT III
XML and HTML5, CSS3

Introduction to XML, Difference b/w Html & XML, XML editors, XML Elements & Attributes XML DTD, XML Schema, XML Parser, Document Object Model (DOM), XML DOM.

UNIT IV

Introduction to HTML5, New features, Local storage, Web Sockets, Server events, Canvas, Audio & Video, Geolocation, Microdata, Drag and Drop. Browser life cycle and browser rendering stages. Service workers.

UNIT V
PHP Server side scripting

Introduction to PHP, Basic Syntax, Variables, constants and operators, Loops, Arrays and Strings, Environment & environment variables, responding to HTTP requests, Files, Cookies, Sessions, Examples.

Books:
1. Practical Web Design for Absolute Beginners, Adrian W. West. Apress 2016
2. Introducing Web Development, Jorg Krause. Apress 2017.
3. HTML & CSS: The Complete Reference, Thomas Powell. McGraw Hill, Fifth Edition, 2010
4. Creating a Website: The Missing Manual, 3rd Edition, Mathew Macdonald. O'Reilly
5. Web Technologies - HTML, JavaScript, PHP, Java, JSP, ASP.NET, XML and Ajax Black, Kogen Learning Systems (Dreamtech Press), 5th Edition 2009.
6. HTML, XHTML & CSS Bible, Brian Pfaffenberger, Steven M.Schafer, Charles White, Bill Karow- Wiley Publishing Inc, 2010
7. HTML5 & CSS3 for the Real World, 2 Edition, Alexis Goldstein, Estelle Weyl, Louis Lazaris. Apress 2015.
8. HTML5 & CSS3 for Dummies, Andy Harris. Wiley 2014.
9. Learning PHP A Gentle Introduction to the Web's Most Popular Language, David Sklar. O'Reilly 2016.
10. Build Your Own Database Driven Web Site Using PHP & MySQL, Kevin Yank. Sitepoint , 4th Edition, 2009.

ENG 107: COMMUNICATION TECHNIQUES LAB

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

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.
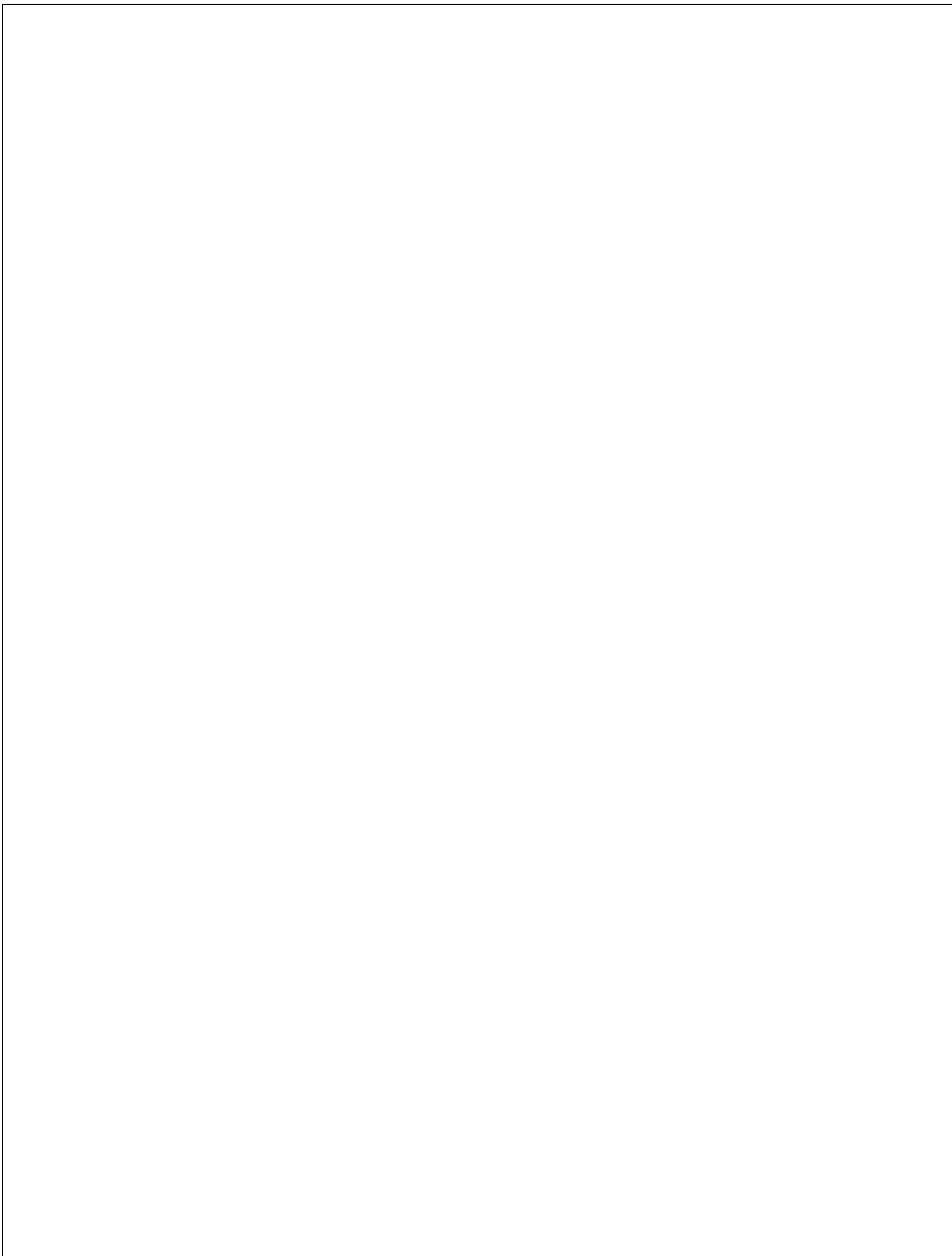
BCSI203: WEB DESIGNING LAB

Practical website development

1. Design a simple web page with head, body and footer, with heading tags, image tag
2. Design a web site for book information, home page should contain books list, when particular book is clicked, information of the books should display in the next page.
3. Design a page to display the product information such as name, brand, price and etc with table tag
4. Design a web site for book information using frames, home page should contain two parts, left part should contain books list, and right part should contain book information.
5. Design a web page to capture the user information such as name, gender, mobile number, mail id, city, state, and country using form elements.
6. Design a web page with nice formatting like background image, text colors and border for text using external CSS.
7. Design a web page to perform mathematical calculations such as addition, subtraction, multiplication, and division using form elements and Java Script.
8. Design a web page to capture the user information such as name, gender, mobile number, mail id, city, state, and country using form elements and display them into other pages using Java Script.
9. Design a web page to display timer in the left side of the web page using Java Script.
10. Design a web page to capture the student details such as student number, name, age, marks using Java Script Object.
11. Design a web page to read data from an XML file and display the data in tabular format, take the data as employee information.
12. Design a web site for online purchase using CSS, JS and XML, web site should contain the following web pages.
    - Home page
    - Login page

    - Signup page
    - Product details page
13. Design a web site for Student details using PHP, web site should contain the following web pages.

    - Home page
    - Login page
    - Signup page
    - Student details page

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

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.
   Communicate to conquer: A handbook of group discussion and interviews, PHI learning, New Delhi.