



Department of Information Technology
Central University of Kashmir
Nowgam Campus III, Srinagar

Syllabus for B. Tech. CSE 2nd Semester

S. No	Course Code	Course Title	Credits	Evaluation		
				CIA	ESE	Total
1.	BT 201	Mathematics II	4	40	60	100
2.	BT 202	Physics II	3	40	60	100
3.	BT 203	Chemistry II	3	40	60	100
4.	BT 204	Basic Electrical Engineering	4	40	60	100
5.	BT 205	Engineering Mechanics	3	40	60	100
6.	BT 206	Physics II Lab	1	40	60	100
7.	BT 207	Chemistry II Laboratory	1	40	60	100
8.	BT 208	Basic Electrical Engineering Lab	1	40	60	100
9.	BT 209	Business Communication & Presentation Skills	2	40	60	100
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BT 201: Mathematics-II

Unit 1: Differential Equations – Differential equations of higher order, existence and uniqueness of solutions, general linear differential equation of order n , linear operators, fundamental theorem on linear differential equations, General solutions with constant coefficients (Distinct real roots and repeated real roots) and Initial Value Problem.

Unit 2: Integral Calculus - Differentiation under the sign of integration. Double and triple integrals, change of order of integration, change of variables.

Unit 3: Matrices - Introduction, Orthogonal and unitary matrices. Triangular matrices, symmetric and skew-symmetric matrices, singular matrices, rank of a matrix (normal form and triangular form), equivalent matrices, elementary transformations, Partitioning of Matrices.

Unit 4: Inverse of a matrix, solution of simultaneous equations by elementary operations, Cramer's rule, normal form, Caley-Hamilton Theorem, Secular Equation, Eigen values and Eigen vectors of a matrix.

References:

1. Advanced Engineering Mathematics by E.Kreyzig.
2. Advanced Engineering Mathematics by H.K. Dass.
3. Ordinary and partial Differential equation, M.D.Raisingania, S.Chand.
4. Linear Algebra,Hoffmann&Kunze, Prentice-Hall.
5. Integral Calculus by Shanty Narayan.
6. Integral Calculus by Chopra and Kochher

BT 202: Physics II

Unit 1: Theory of Relativity: Galilian Transformation and its properties, Invariance of an equation and concept of ether, Michelson Morley experiment, Einstein's postulates and Lorentz transformation equations, length, time and simultaneity in relativity, addition of velocity, variation of mass with velocity, mass-energy relation, energy- momentum relation.

Unit 2: Quantum Theory: Need for the quantum theory and limitations of classical theory, Planks hypothesis, De-Broglie Hypothesis, Wave particle duality, Davission-Germer experiment, matter waves; group and phase velocities, Photoelectric effect detailed treatment, The Compton effect detailed treatment, Uncertainty principle and its application.

Unit 3: Basic postulates of Quantum Mechanics: Wave function and its properties, time independent and time dependent, Schrodinger wave equation, Eigen values and Eigen functions, Born's interpretation and normalization of wave function, orthogonal wave functions, applications of Schrodinger wave equation particle in a box and harmonic oscillator

Unit 4: Lasers: Interaction of radiation with matter, energy levels of the system and transitions, emission and absorption of radiation Spontaneous and stimulated emission, Einstein's coefficients, population inversion and optical pumping; Three and four-level lasers, Ruby, He-Ne, Nd: YAG, CO₂, Semiconductor lasers, Industrial and medical applications of lasers.

Text Books:

1. Concepts of Modern Physics by Arthur Bieser, McGraw Hill.
2. Quantum Mechanics by G.Aruldas ,PHI learning, 2009.
3. Basic Quantum Mechanics by A Ghatak, Macmillan India Limited.

BT 203: Chemistry II

Unit 1:

Environmental chemistry: Pollution (Air, Water, Soil, Radioactive) and its Control, Lapse rate and Inversion Temperature, BOD, COD, TOC Overview, Solid Waste Management, Green House Effect, Global Warming, Role of Electromagnetic Radiation in Global Warming, Recycling. Electrochemistry: Introduction, Cells and Batteries, Li-Polymer Vs Li-ion Battery.

Unit 2:

Photo Chemistry and Nuclear Chemistry: Introduction to Photochemistry, Laws of Photochemistry, Colorimetric Analysis, Photochemical Technology, Chemistry of Vision, Spectroscopy, Magnetic Resonance Imaging Overview, Chromatography and its types. Nuclear Chemistry: Introduction, Fission, Fusion, Radioisotope, Radiodating

Unit 3:

Explosives, Propellants and Corrosion: Explosives, Classification, Precaution During Storage, Blasting Fuses, Manufacture of some Important Explosives, Rocket Propellants and Classification. Definition, Scope of Corrosion, Direct Chemical Corrosion, Electrochemical Corrosion, Application and Protection Against Corrosion.

Unit 4:

Bio-Technology and Nanotechnology: Introduction to Bio-Technology, Application, Fermentation-General Outline, Deamination, Phase Rule, Alloys and Its types, Nanotechnology, Top Down- Bottom Up Approach Process, Nano-Dynamics, Nano Crystals and Nano Particles. Combined Approach of Nanotechnology in Medicine.

Text/Reference Books:

1. P.C. jain and M.jain , *Engineering Chemistry*, DHANPAT RAI Publishing Co.
2. Shahshi Chawla, *A Text book of Engineering Chemistry*, DHANPAT RAI Publishing Co.
3. S.S.Dara, S.S.Umare, *A Text Book of engineering Chemistry*, S.Chand Publishing.
4. Thomas Bliss Stillman, *Engineering chemistry; a manual of quantitative chemical analysis*.

BT 204: Basic Electrical Engineering

Unit 1

Electric Circuit Laws: Basic electric circuit terminology, Ohm's law, Kirchhoff's current law. (KCL) and Kirchhoff's voltage law (KVL) circuit parameters (Resistance, Inductance and capacitance). Series and Parallel combinations of resistance, Inductance and capacitance, Meshloop Analysis, Nodal analysis.

Unit 2

Energy Source: Ideal and practical voltage and current sources and their transformation.

Dependent Sources: Dependent voltage sources and dependent current sources.

Unit 3

D.C. Circuit Analysis: Power and energy relations, Analysis of series parallel d.c. circuits, Delta star (Y) Transformation, Loop and Nodal methods, Thevenin's, Norton's theorem, Maximum Power transfer theorem, Superposition theorem.

Unit 4

A.C. Circuit Analysis: Basic terminology and definitions, Phasor and complex number representations, solutions of sinusoidal excited, RC circuits, power and energy relations in a c circuits, Applications of network theorems to a.c. circuits, Resonance in series and parallel circuits.

Magnetically Coupled Circuits: Mutual inductance, Theory of magnetic circuits and electromagnetism. Transformers.

References:

1. Toro V. Del, Principles of Electrical Engineering, Prentice- Hall International.
2. Hayt W.H. & J.E. Kemmerly, Engineering Circuit Analysis, McGraw Hill.
3. Electrical Technology by B.L Theraja, S.Chand group
4. Nagrath I.J., Basic Electrical Engineering, Tata cGraw Hill.
5. Fitzgerald A.E., D.E., Higginbotham &AGrabel, Basic Electrical Engineering, McGraw Hill.
6. Cotton H., Advanced Electrical Technology, Wheeler Publishing.
7. Electrical Engineering by Rizzoni.
8. Kothari D P and Nagrath I J, "Basic Electrical Engineering", Tata McGraw Hill, New Delhi (1996).
9. Electrical Machines. By Bhattacharya.

BT 205: Engineering Mechanics

The objective of this course is to provide an introductory treatment of engineering Mechanics to all the students of engineering, with a view to prepare a good foundation for taking up advance course in the area in the subsequent semesters.

Unit 1:

Introduction Engineering Mechanics, Applications, Definition, Stress, Strain, Tensile and Compressive Stress, Shear Stress, Elastic Limit, Hook's Law, Poission's Ratio, Modulus of Elasticity, Modulus of rigidity, Bulk Modulus, Bar of uniform Strength, Temperature Stress, volumetric Strain.

Unit 2:

Strain Energy, Elastic, Plastic and Rigid Members, Stress due to different types of axial loading, Gradually applied Loads, Suddenly applied loads, Impact load. Riveted Connections, Types of joints-Lap joint and Butt joint, Tearing Strength, Shearing Strength, Bearing Strength, Efficiency of Joint.

Unit 3:

Center of Gravity, Lamina, Centroid of Uniform Lamina, Centroid of Various Shapes, Triangle, circle, Trapezium, Welding Connections, Process of Welding, Advantages of Welding Connection, Disadvantages of Welding Connections, Process of Soldering, Need of Soldering.

Unit 4:

Introduction to Beams & Need, Cantilever, Simply Supported Beam, Fixed Beam, Continuous Beam, Generalization of Shear force and Bending Moment. Analysis of Framed Structure, perfect Frame, Deficient Frame, Analysis of Truss, Method of Joints.

Text/Reference Books:

1. Khurmi RS(2015), Engineering Mechanics, S. Chand & Co.
2. Ramamurtham(2014) Strength of Materials, Dhanpat Rai Publishing Company.
3. Shanes & Rao (2006), Engeneering Mechanics, Pearson Edu.
4. Tayal A.K (2010), Engineering Mechanics, Umesh Publication.

BT 209: Business Communication & Presentation Skills

Unit 1

Role of communication in information age; concept and meaning of communication; skills necessary for technical communication; Communications in a technical organization; Listening, speaking, reading and writing as skills. Objectivity, clarity, precision as defining features of technical communication; Various types of business writing: Letters, reports, notes, memos; Language and format of various types of business letters.

Unit 2

Oral Presentation and professional speaking: Basics of English pronunciation; Elements of effective presentation; Body Language and use of voice during presentation; Connecting with the audience during presentation; Projecting a positive image while speaking; Planning and preparing a model presentation; Organizing the presentation to suit the audience and context; Basics of public speaking; Preparing for a speech

Unit 3

Career Oriented Communication: Resume and biodata: Design & style; Applying for a job: Language and format of job application. Job Interviews: purpose and process; How to prepare for interviews; Language and style to be used in interview; Types of interview questions and how to answer them;

References:

1. Fred Luthans, Organizational Behaviour, McGraw Hill
2. Lesikar and petit, Report writing for Business
3. M. Ashraf Rizvi, Effective Technical Communication, McGraw Hill
4. Wallace and masters, Personal Development for Life and Work, Thomson Learning
5. Hartman Lemay, Presentation Success, Thomson Learning
6. Malcolm Goodale, Professional Presentations
7. Farhathullah, T. M. Communication skills for Technical Students
8. Michael Muckian, John Woods, The Business letters Handbook
9. Herta A. Murphy, Effective Business Communication
10. MLA Handbook for Writers of Research Papers