



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

**Syllabus for B. Tech. CSE 1<sup>st</sup> Semester**

S. No	Course Code	Course Title	Credits	Evaluation		
				CIA	ESE	Total
1.	BT 101	Mathematics I	4	40	60	100
2.	BT 102	Physics I	3	40	60	100
3.	BT 103	Chemistry I	3	40	60	100
4.	BT 104	Engineering Drawing	2	40	60	100
5.	BT 105	Engineering Workshop	2	40	60	100
6.	BT 106	Computer Programming	4	40	60	100
7.	BT 107	Physics I Laboratory	1	40	60	100
8.	BT 108	Computer Programming Lab	2	40	60	100
9.	BT 109	Chemistry I Lab	1	40	60	100
10.	BT 110	Sociology & Elements of Indian History for Engineers	2	40	60	100
			24			

# I<sup>st</sup> Semester

## BT 101: Mathematics I

**Unit 1:** Elements of Logic - necessary and sufficient conditions, theorems and proofs (direct and contra positive). Sets and Functions - Elementary set theoretic operations, De Morgan's law. Relations and Correspondences and its types, number systems. Function overview and composition of function. Sequences and series - Arithmetic Progression, Geometric Progression and Harmonic Progression.

**Unit 2:** Vectors – laws of vector algebra, operations – dot, cross, triple products. Vector function – limits, continuity and derivatives. Gradient, divergence and curl – formulae. Orthogonal coordinates.

**Unit 3:** Differentiation - concept of derivative, standard rules of differentiation, total and partial derivatives, homogenous functions, Euler Theorem. Maxima and Minima. Lagrange's mean value theorem, Rolle's Theorem, Chuchy Mean value theorem.

**Unit 4:** Integration – basic concept, definite and indefinite integral. Standard rules of integration, partial integration, Integration by parts, Integration by substitution. Surface, line and volume integrals.

### References:

1. Differential Calculus by M. L Kochhar, Kapoor brothers;
2. Integral Calculus by M. L Kochhar, Kapoor brothers;
3. Linear Algebra: Schaum's Outline Series, Tata McGraw Hill;
4. Discrete Mathematics: Schaum's Outline Series, Tata McGraw Hill;

# **BT 102: Physics I**

## **Unit 1 :Electrostatics**

A brief introduction of vector algebra. Gradient of a Scalar, Divergence and curl of a vector, Gauss's law and its applications, Electric potential and electric field (in vector form). Potential due to a monopole, Dipole and multipoles (multiple expansion), Work and energy in electrostatics; dielectrics, Polarization, electric displacement, Susceptibility and permittivity, Clausius Mossotti Equation.

## **Unit 2: Magneto-statics and Electrodynamics**

Lorentz Force law; magnetic field of a steady current (Biot-Savart Law), Ampere's law in magnetized materials, electromotive force, Faraday's law, Maxwell's Equations, Wave Equation.

## **Unit 3: Electromagnetic waves**

Waves in one dimension: The wave Equation, Sinusoidal waves, Boundary Conditions: Reflection and Transmission, Polarization, Electromagnetic Waves in Matter: The Wave Equation for E and B, Energy and momentum in Electromagnetic waves, Electromagnetic Waves in conductors, Wave Guides.

## **Unit 4: Conductors and Semiconductor Devices**

Conductors: classical free electron theory (Lorentz-Drude theory) – electric conductivity.

Semiconductors and insulators – direct and indirect band gaps, Fermi level for intrinsic (derivation) and extrinsic semiconductors (dependence on temperature and doping concentration). Diffusion and drift current (qualitative ), Conductivity and photoconductivity, Optical response; Classification of different types of diode on the basis of concentration (rectifier diode, Zener diode, tunnel diode); Concept of optoelectronics, Light Emitting Diode (as direct band gap material), solar cell, avalanche and photodiode.

## **References**

1. Introduction to Electrodynamics, David J. Griffiths, Printice Hall of India, New Delhi.
2. Semiconductor Physics and Devices: Basic principle, Donald A. Neaman, McGraw Hill, New York.
3. Introduction to solid state physics, Charles Kittel, Wiley, Delhi (2007).
4. Fundamentals of physics, D. Halliday, R.Resnick and J. Walker,John Wiley and Sons, New York (2001)
5. Electronic devices and circuits, J.B Gupta, published by S.K kataria and sons.

## **BT 103: Chemistry I**

### **Unit 1. Water**

Sources, Hardness of water, soft and hard water, units of hardness, EDTA method of estimation of hardness, softening of hard water –Lime soda process-Zeolite process- Ion exchange process , Scale and sludge formation in boilers, removal of scales – carbonate conditioning- colloidal conditioning- calgon conditioning- phosphate conditioning , Concept of water harvesting, storage and recycling, desalination – water treatment for drinking purpose.

### **Unit 2. Polymers**

Nomenclature, Functionality, Classification, Methods of Polymerization, Plastics, Thermoplastic and Thermosetting resins, Molecular weight of a Polymer, Rubber-Vulcanization-Elastomers -Reclaimed Rubber, Conducting Polymers.

### **Unit 3. Fuels And Lubricants**

Classification of fuels, Characteristics of Good Fuel, Calorific value and its determination, Bomb Calorimeter, Gas Calorimeter, Theoretical Calculation of Calorific values, Classification and selection of Coal. Lubricants, Mechanism of Lubrication, Classification of Lubricants, Properties of Lubricating oils-Viscosity and its measurement(Redwood viscosimeter )-Flash and Fire points- Oiliness, Cloud point , pour point, Emulsification.

### **Unit 4.Green Chemistry**

Principles of Green Chemistry, R4M4 model(Reduce, Reuse, Recycle, Redesign; Multipurpose, Multidimensional, Multitasking, Multi-Tracking )Molecular and Atomic Economy, Life cycle analysis Technique.

### **References:**

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 106: Computer Programming**

### **Unit 1:**

Introduction to computer organization; Evolution of Operating Systems; Machine languages, Assembly Languages and High Level Languages, Program Development in C, Structured Programming - Algorithm, Pseudo-code; The C Standard Library, Data types in C, Arithmetic operators, Control Structures – If-else, While, for, do-while, Switch, break and continue statements; Formatted input-output for printing Integers, floating point numbers, characters and strings; Simple C Programming examples;

### **Unit 2:**

Designing Structured Programs in C covering, Top Down Design and Stepwise refinement; Function Definition, Parameter passing in C, Call by Value and Call by Reference; Standard functions, Recursive functions, Preprocessor commands, Example C programs; Scope, Storage classes; Arrays covering, Declaring arrays in C, Passing arrays to functions, Array applications, sorting, Two – dimensional arrays, Multidimensional arrays.

### **Unit 3:**

Pointers in C, Pointer variable declaration and Initialization. Pointer operators, Pointer expressions and Arithmetic, Relationship between pointers and arrays; Strings including Concepts, String Conversion functions, C Strings, String Manipulation Functions and String Handling Library;

### **Unit 4:**

Derived types covering, Structures – Declaration, definition and initialization of structures, accessing structures, structures in functions, self referential structures, unions, Dynamic Memory Allocation, Working with files.

### **References:**

1. Dietel & Dietel (2000), C – How to Program, Pearson Education
2. B.W. Kernighan and Dennis M.Ritchie (1988), The C Programming Language, Pearson Education
3. J.R. Hanly and E.B. Koffman (2007), Problem Solving and Program Design in C, Pearson Education
4. A.M. Tanenbaum, Y. Langsam & M.J. Augenstein(2005),Data Structures using C, Pearson Education

## **BT 110: Sociology & Elements of Indian History for Engineers**

The objective of this course is to familiarize the prospective engineers with elements of Indian history and sociological concepts and theories by which they could understand contemporary issues and problems in Indian society. The course would enable them to analyze critically the social processes of globalization, modernization and social change. All of this is a part of the quest to help the students imbibe such skills that will enhance them to be better citizens and human beings at their work place or in the family or in other social institutions.

### **Unit I: Approaches and Concepts**

1. Understanding Family, Society and Social Order
2. Social Stratification: Class, Caste and Gender
3. Concepts of Liberty, Equality, Justice and Rights
4. Social Plurality : Ethnicity, Language and Religion

### **Unit II: Modern History and Politics of India**

1. Colonialism and Nationalism
2. Government and its Structure : Executive, Legislature and Judiciary
3. Processes of Social Inclusion and Exclusion
4. Globalisation and Sustainable Development

### **References:**

1. A. R. Desai, (2005), Social Background of Indian Nationalism, Popular Prakashan.
2. Anthony Giddens (2006), Sociology, Polity Press.
3. Bhowmik, S (ed.) (2010), Street Vendors in the Global Urban Economy, Routledge.
4. Chandoke, Neera & Praveen Priyadarshi (2009), Contemporary India: Economy, Society and Politics, Pearson.
5. George Ritzer, (2010), Globalisation: A Basic Text, John Wiley and Sons.
6. Jean Dreze and Amartya Sen (2014), An Uncertain Glory: India and its Contradictions, Princeton University Press.
7. John Rawls (1971), A Theory of Justice, Cambridge Belknap Press
8. M. Haralambos and R. M Heald (2007), Sociology: Themes and Perspectives, Oxford University Press
9. R. S. Sharma.(1965), Indian Feudalism, Macmillan.
10. Rajeev Bhargav and Ashok Acharya (2008), Political Theory: An Introduction, Pearson Education.