

**SYLLABUS**  
**FOR**  
**B.TECH. PROGRAMME**  
**IN**  
**ELECTRICAL ENGINEERING**



**INSTITUTE OF TECHNOLOGY**  
**ZAKURA CAMPUS**  
**UNIVERSITY OF KASHMIR**  
**SRINAGAR J&K, 190006**  
**As Per BOS Held In August 2017**

**COURSE STRUCTURE**  
**B.Tech 1<sup>st</sup> Semester ELE**  
**University of Kashmir, Zakura Campus**

Course Code	Course Title	Teaching Periods Per Week			Credits
		L	T	P	
MTH-1117B	Engineering Mathematics-I	3	1	0	4
PHY-1217B	Engineering Physics	3	1	0	4
ELE-1317B	Basic Electrical Engineering	3	1	0	4
CSE-1417B	Fundamentals of Computer Programming	2	1	0	3
HUM-1517B	Communication Skills	2	1	0	3
MEE-1617B	Engineering Drawing	3	1	0	4
PHY-1217BL	Engineering Physics Lab	0	0	2	1
ELE-1317BL	Basic Electrical Engineering Lab	0	0	2	1
CSE-1417BL	Fundamentals of Computer Programming Lab	0	0	2	1
<b>Total</b>		<b>16</b>	<b>6</b>	<b>6</b>	<b>25</b>

**Applicable To Batch 2017 & Onwards**

***FIRST SEMESTER***

**COURSE CODE: MTH-1117B****ENGINEERING MATHEMATICS - I****Credits: 04**

<b>S. No</b>	<b>Topics</b>	<b>Number of Hours</b>
1.	Calculus: Differential calculus of functions of several variables, Partial differentiation, Homogeneous functions and Euler's theorem,	8
2.	Taylor's and Maclaurin's series, Taylor's theorem and mean value theorem for functions of two variables, Errors and approximations	8
3.	Applications of Differential Calculus: Maxima and minima of several variables, Lagrange's method of multipliers for maxima and minima Curvature of Cartesian curves, Curvature of parametric & polar curves.	9
4.	Applications of Definite Integrals: Application of definite integrals to area, arc length, surface area and volume, Double integrals, Triple integrals.	8
5.	Vector Calculus: Scalar and vector fields, differentiation of vectors, Velocity and acceleration, Vector differential operator, Del, Gradient and Divergence, Physical interpretation of the above operators, Line, surface and volume integrals	9
6.	Application of Vector Calculus: Flux, solenoidal and irrotational vectors, Green's, Gauss' and Stokes' theorems and their applications.	8
Total number of Hours		50

**Text Books:**

<b>S.No</b>	<b>Name of Book</b>	<b>Author</b>	<b>Publisher</b>
1.	Advanced Engineering Mathematics	Kreyszig E	John Wiley, Singapore
2.	Advanced Engineering Mathematics	Jain, RK and Iyengar SRK	Narosa Publishing House
3.	Differential Calculus	Das & Mukherjee	U.N. Dhur & Sons Pvt. Ltd
4.	Integral Calculus	Das & Mukherjee	U.N. Dhur & Sons Pvt. Ltd

**COURSE CODE: PHY-1217B****ENGINEERING PHYSICS****Credits: 04**

<b>S. No</b>	<b>Topics</b>	<b>Number of Hours</b>
1.	Vectors and Electrostatics: Work and energy in electrostatics; dielectrics, Polarization, electric displacement, Susceptibility & permittivity, ClausiusMossotti equation. Transformation of vectors. Spherical and cylindrical coordinates system, Gradient of a scalar	7
2.	Divergence and curl of a vector, Gauss' law and its applications, Electric potential and electric field (in vector form), Potential due to a monopole, Dipole and multipoles (multipole expansion)	7
3.	Magneto-statics: Lorentz Force Law; magnetic field of a steady current (Biot-Savart law), Ampere' law and its applications, Ampere' law in magnetized materials.	6
4.	Electrodynamics: Electromotive force, Faraday' law, Maxwell' s Equations, Wave Equation. Poynting Vector, Poynting Theorem (Statement only), Propagation of EM-Wave in conducting and non-conducting media. Interference due to division of wave front and division of amplitude. Young' s double slit experiment	7
5.	Interference and Diffraction: Interference and principle of superposition. Theory of biprism, Interference from parallel thin film, wedge shaped films, Newton' s rings, Michelson Interferometer. Fresnel' s Diffraction, Diffraction at straight edges, Fraunhofer diffraction due to N-Slits, Diffraction grating, dispersive power of grating, resolving power of prism and grating.	6
6.	Theory of Relativity: Invariance of a 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.	6
7.	Quantum Theory: The Compton effect, matter waves; group and phase velocities, Uncertainty principle and its application; time independent and time dependent	5
8.	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).	6
<b>Total number of Hours</b>		<b>50</b>

**Text Books:**

<b>S.No</b>	<b>Name of Book</b>	<b>Author</b>	<b>Publisher</b>
1.	Introduction to Electrodynamics	Griffiths D	Prentice Hall of India
2.	Perspective of Modern physics	Beiser	McGraw-Hill
3.	Elementary Modern Physics	Arya AP	Addison-Wesley, Singapore
4.	Introduction to Modern Physics	Mani, HS and Mehta GK	Affiliated East West Press, New Delhi

**COURSE CODE: ELE-1317B****BASIC ELECTRICAL ENGINEERING****Credits: 04**

<b>S. No</b>	<b>Topics</b>	<b>Number of Hours</b>
1.	Review of basic electrical Signals, Review of electric circuit concepts, Terminology, Electric circuit parameters (Resistance, Conductance, Inductance, Capacitance, Reactance, Impedance), Basic electric circuit terminologies: Nodes, Junctions, Paths, Loops, Branches, Series and Parallel combinations of resistance.	3
2.	Ideal and practical voltage and current sources and their transformation, Dependent Sources, Power and energy relations, Ohm's law: validity of ohms law, Ohmic and non Ohmic conductors, applications of ohms law.	5
3.	Introduction to D.C. voltage & Current and D.C. circuits, Voltage and current Divider Laws, Kirchhoff's current law (KCL) and Kirchhoff's voltage law (KVL), Analysis of series & parallel D.C. Circuits: Loop analysis of D.C. Circuits, Nodal methods of analysis, Mesh analysis, Super node, and Super mesh.	8
4.	Super-position theorem, Thevenin's theorem, Norton's theorems, Maximum power transfer theorem, Reciprocity & Millman's theorem, Delta-Star (Y) Transformations.	7
5.	Introduction to Alternating Voltage & Current and A.C. circuits, Basic terminology and definitions (Signal, Parameters, Generation, Applications, non-sinusoidal A.C.'s, EMF Equations, Mean, Average, RMS, Peak, and Form Factor), Complex number representation of A.C. circuits.	7
6.	Phasor representation of A.C. circuits, Solutions of sinusoidally excited RLC circuits, Power and energy relations in A.C. circuits, Concepts of active & reactive powers.	7
7.	Applications of network theorems to A.C. circuits, Resonance in series and parallel circuits.	6
8.	Single and three phase A.C. systems, Analysis of 3 phase systems, Current and voltage relationships in Y- $\Delta$ & $\Delta$ -Y configurations, Balanced / un-balanced systems.	7
Total number of Hours		50

**TextBooks:**

<b>S.No</b>	<b>Name of Book</b>	<b>Author</b>	<b>Publisher</b>
1.	Fundamentals of Electric Circuits	Alexander & Sadiku	McGraw-Hill
2.	Engineering circuit Analysis	Hayt & Kimberly	McGraw-Hill
3.	Electric Engineering Fundamentals	Vincent Del Toro	PHI
4.	Introduction to Circuit Analysis & Design	Glisson	Springer
5.	Basic Electric Circuit Analysis	Johnson, Hilburn,	Wiley

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**COURSE CODE: CSE-1417B****FUNDAMENTALS OF COMPUTER PROGRAMMING****Credits: 03**

S. No	Topic	No. of Hours
1.	Introduction to Programming and Problem Solving–Types of Programming Languages–Machine Level, Assembly level, and High Level language.	2
2.	Introduction to C Language–Brush-up of algorithms and flowcharts. Character set, Variables and Identifiers, Built-in Data Types, Variable Definition, Arithmetic operators and Expressions, Constants and Literals, Simple assignment statement, Basic input/output statement.	5
3.	Simple C programs Conditional Statements and Loops–Decision making within a program, Conditions, Relational Operators, Logical Connectives, if statement, if-else statement.	5
4.	Loops: while loop, do while, for loop, Nested loops, Infinite loops, Switch statement, structured Programming.	4
5.	Arrays–one dimensional array: Array manipulation; Searching, Insertion, Deletion of an element from an array; Finding the largest/smallest element in an array; Two dimensional arrays, Addition/Multiplication of two matrices.	6
6.	Functions–Modular programming and functions, Standard Library of C functions, Prototype of a function: Formal parameter list, Return Type, Function call, Block structure, Passing arguments to a Function: call by reference, call by value, Recursive Functions, arrays as function arguments.	6
7.	Structures and Unions–Structure, nested structure, structures and functions, structures and arrays: arrays of structures, structures containing arrays, unions,	5
8.	Pointers–Address operators, pointer type declaration, pointer assignment, pointer initialization, pointer arithmetic, functions and pointers, Arrays and Pointers, pointer arrays.	6
Total		39

**Text Books:**

S. No	Name of Book	Author	Publisher
1.	Programming with C	Byron Gottfried	Pearson Education
2.	Programming with ANSI & Turbo C	A. Kamthane	Pearson Education
3.	Programming in C	Pradip Dey, Manas Ghosh	Oxford University Press
4.	Programming Language Concepts and Constructs	Ravi Sethi	Pearson Education



**COURSE CODE: HUM-1517B****COMMUNICATION SKILLS****Credits: 03**

S. No.	Topic	No. of Hours
1.	Communication: Meaning, its types, significance, process, Channels, barriers to Communication, making communication effective, role in society, Communication model.	5
2.	Discussion Meeting and Telephonic Skills: Group discussions, conducting a meeting, attending telephonic calls, oral presentation and role of audio visual aids.	5
3.	Grammar: Transformation of sentences, words used as different parts of speech one word substitution, abbreviations, technical terms etc.	5
4.	Reading Skills: Process of reading, reading purposes, models, strategies, methodologies, reading activities.	4
5.	Writing Skills: Elements of effective writing, writing style, scientific and technical writing.	4
6.	Listening Skills: The process of listening, the barrier to listening, the effective listening skills, feedback skills. Speaking Skills: Speech mechanism, organs of speech, production and classification of speech sound, phonetic transcription, the skills of effective speaking, the components of effective talk.	5
7.	Business Letters: Structure of business letters, language in business letters. Letters of inquiry & their places. Sales Letters, Memorandum, Quotations/tenders, Bank correspondence, Letters of application and appointments,	4
8.	Resumewriting, Report Writing,	3
9.	Conducting a Meeting, Minutes of Meeting, Oral Presentation, Group Discussion, CV writing, Purchase order, Job Application Letter.	4
Total		39

**Text Books:**

S. No	Name of Book	Author	Publisher
1.	Effective Business Communication	Rodrigues M V	Concept Publishing Company
2.	Handbook of Practical Communication Skills	Wright, Chrissie	Jaico Publishing
3.	An Approach to Communication Skills	Bhattacharya. Indrajit	Dhanpatrai Co
4.	Modern Business Correspondence	Gartside L	Pitman Publishing London
5.	How to Write and Publish a Scientific Paper	Day, Robert A	Cambridge University
6.	An Introduction to the Pronunciation of English	Gimson A C	ELBS

**COURSE CODE: MEE-1617B****ENGINEERING DRAWING****Credits: 04**

S. No.	Topic	No. of Hours
1.	Introduction to engineering drawing (equipment, drafting tools, symbols and conventions in drawing), dimensioning, types of lines and their use, dividing a given straight line into any number of equal parts, bisecting a given angle, drawing a regular polygon given one side, special methods of constructing a pentagon and hexagon. Conic sections, ellipse, parabola, hyperbola, cycloid and trochoid.	04
2.	Projection of lines: Line parallel to both the planes, Line parallel to the horizontal plane and perpendicular to the vertical plane, line parallel to HP and inclined to VP, line parallel to HP and inclined to profile plane, line parallel to VP and inclined to HP, line inclined to both the planes.	09
3.	Projection on horizontal and vertical planes, principal views, different system of projections, symbols, notations. Projection of Planes in first and third quadrant. Projection of solids in first and third quadrant, axis parallel to one and perpendicular to other.	09
4.	Section planes perpendicular to one plane and parallel or inclined to other plane.	09
5.	Development of prisms, pyramids and cylindrical & conical surfaces.	09
6.	Isometric projection and isometric views of different planes and simple solids, introduction to perspective projection.	10
Total		50

**TextBooks:**

S. No	Name of Book	Author	Publisher
1.	Engineering Graphics and drafting	GillP, S	Katria and Sons
2.	Elementary Engineering Drawing- Plane and Solid Geometry	Bhat N.D.	ChartotarPublishing House
3.	Fundamentals of Engineering Drawing	Luzzad.W.J	Prentice Hall of India

**COURSE CODE: PHY-1217BL**

**ENGINEERING PHYSICS LAB**

**Credits: 01**

S. No.	Experiment
1.	Measurement of Resistance.
2.	Measurement of e/m by Helical method.
3.	Measurement of Numerical Aperture of Optical Fiber.
4.	Determination of Resistivity of a given wire.
5.	Determination of Band Gap of a semiconductor.
6.	Verify Biot-Savart law.
7.	To determine the refractive index of the prism material using spectrometer.
8.	To verify the laws of vibrating strings by Melde's experiments.
9.	To determine the wavelength using Fresnel's biprism/diffraction grating.
10.	To Determine Plank's Constant.

**COURSE CODE: ELE-1317BL**

**BASIC ELECTRICAL ENGINEERING LAB**

**Credits: 01**

S. No	Experiment
1.	To study the colour coding of resistors
2.	Connection of Ammeters, Voltmeters, Wattmeters and multi-meters in DC and AC circuits and selection of their ranges.
3.	Use of LCRQ meter.
4.	To study the series / parallel operation of resistors and verifying their effective values by LCRQ meter.
5.	To verify the KVL and KCL in DC circuits.
6.	To verify the star delta transformation of networks.
7.	To verify the superposition theorem.
8.	To verify the maximum power transfer theorem
9.	Basic R, L, C circuits excited from A.C
10.	To measure electric power in single-phase AC circuits with resistive load, RL load and RLC load.
11.	To measure the power and power factor in three phase AC circuits.
12.	To study the series resonance.
13.	To study the parallel resonance.
14.	To study the handling of CRO and use it for the study of different voltage waveforms.

**COURSE CODE: CSE-1417BL**

**FUNDAMENTALS OF COMPUTER PROGRAMMING LAB**

**Credits: 01**

S. No.	Experiment
1.	Program to understand basic data types.
2.	Programming on looping and decision statements.
3.	Example of Fibonacci series program.
4.	Finding a factorial for a given number.
5.	Programs using i. Library functions. ii. Built-in math functions.
6.	Programs on i. functions ii. arrays iii. string manipulations iv. Structures and unions. v. Pointers. vi. Basic file operations.