

**Syllabus for Lateral Entry Examinations - 2020**

**ECE, CSE and IT**

1. **Computer, Programming and Basic Data Structures:** Introduction to computers, Structured programming in C, Data types, Control flow, Selection, Looping, Array, String, Pointer, Function, Structure, Union, Iteration, File I/O, Linked list. Number system and representation, Fixed and Floating point numbers, Binary arithmetic, Character representation, Recursion and its Removal, Stack, Queue, BST.
2. **Basic Electric and Electronic Circuits:** Analysis of simple DC and AC circuits, Resonance. Thevenin and Norton theorems. Transformers and electrical machines. Basic semiconductor devices. Transistors, amplifiers, Feedback amplifiers and oscillators. OP-Amps and circuits. Boolean algebra, Logic gates and circuits, Flip-flops. Shift registers and counters.
3. **Physics**  
**Electromagnetics:** Laplace's Equation, Poisson's Equation, Maxwell's Equations, Electromagnetic waves, Poynting vector, Reflection and Refraction of EM waves from dielectric surfaces, Total internal reflection.  
**Optics:** Interference, Diffraction and Polarization.  
**Special Theory of Relativity:** Lorentz Transformation, Length contraction, Time dilation, Mass-energy relation.  
**Laser:** Statistical Distribution, Spontaneous and Stimulated Emission, Ruby Laser and He-Ne Laser,
4. **Mathematics**  
**Calculus**  
Limit, Continuity, Differentiation and Integration of functions of one real variable, Taylor's theorem, Ordinary differential equations, Partial differentiation, maxima and minima of functions of two variables, Multiple Integrals with applications..  
**Vector Analysis**  
Differentiation of Vectors, Gradient, Divergence and Curl, Line and Surface Integrals, Gauss Divergence theorem  
**Matrices**  
Algebra of matrices, Inverse of a matrix, Eigenvalues and Eigenvectors