

Syllabus for Lateral Entry Examinations - 2022

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.
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.