

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

Syllabus for the VTU-ERT (Ph.D. Programme)

For Faculty of Engineering & General Science

20 Marks

Part I: Mathematics Section

Common to:

Civil Engineering Science / Mechanical Engineering Science / Electrical Engineering Science / Computer Sciences / Textile / Silk Engineering / Chemical Engineering/ Polymer Science / Bio-Tech / Physics / Chemistry / Mathematics & M.Sc(Engg)

1. **Matrices** : Definition, elementary row operations and echelon forms, Rank of matrix, systems of linear equations, consistency, solution of homogeneous and non-homogeneous equations, Eigen value and Eigen vectors of a square matrix
2. **Calculus**
 - a) **Differential Calculus:** Limits and Continuity, Differentiation, Partial Derivatives.(Basic)
 - b) **Integral Calculus:** Reduction formulae, Definite Integrals, and Multiple Integrals.
3. **Vector Algebra and Complex numbers:** Definitions, Vector products,(dot and cross Properties, Amplitude & Modules of a Complex number, De Moivre's theorem and examples
4. **Numerical Analysis** – Numerical Solutions of Algebraic and transcendental equations, Finite differences, Interpolation (For equal and unequal intervals) Numerical Integration
5. **Statistics and Probability**
Measures of central tendency and dispersion curve fitting by least square methods, Correlation and regression analysis, Probability: Axioms, conditional Probability, Probability distribution-Binomial Poisson and Normal distribution.

TEXT BOOKS:

- | | |
|--|--|
| 1. Higher Engineering Mathematics- | Dr. B.S.Grewal(37 th Edition) |
| 2. Elementary Engineering Mathematics- | Dr. B.S. Grewal |
| 3. Advanced Engineering Mathematics- | Erwin Kreyszig |
| 4. Introduction to Numerical Analysis- | S.S.Sastry |