Indira Gandhi University, Haryana
B.E./B.Tech CSE Sem 2 syllabus

Basic Electrical Engineering

Section A

DC Circuits
Electrical circuit elements (R, L and C), voltage and current sources, Kirchoff current and voltage laws
with their applications (Nodal and Mesh Analysis), analysis of simple circuits with dc excitation.
Superposition, Thevenin and Norton Theorems. Time-domain analysis of first-order RL and RC circuits.
AC Circuits
Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power,
reactive power, apparent power, power factor. Analysis of single-phase ac circuits consisting of R, L, C,
RL, RC, RLC combinations (series and parallel), resonance.

Section B

Transformers
Magnetic materials, BH characteristics, ideal and practical transformer, equivalent circuit, losses in
transformers, transformer tests regulation and efficiency. Auto-transformer and three-phase transformer
connections.
Polyphase Circuits
Three phase balanced circuits, voltage and current relations in star and delta connections. Power
Measurement by two wattmeter method.

Section C

Electrical Machines
Generation of rotating magnetic fields, construction, working, starting and speed control of single-phase

induction motor. Construction and working of a three-phase induction motor. Construction, working,
torque-speed characteristic and speed control of dc motor. Construction and working of synchronous
generators.

Section D

Measuring Instruments
Construction, operating and uses of moving iron type and moving coil type, induction type voltmeter,
Ammeter, watt meter, energy meter.
Electrical Installations
Components of LT Switchgear: Introduction to Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of
Wires and Cables, Earthing. Types of Batteries, Important Characteristics for Batteries. Elementary
calculations for energy consumption, power factor improvement and battery backup.

Suggested Text / Reference Books

1. E. Hughes, “Electrical and Electronics Technology”, Pearson Education.

2. D. P. Kothari and I. J. Nagrath, “Basic Electrical Engineering”, Tata McGraw Hill, 2010.
3. S. K Sahdev, Basic of Electrical Engineering, Pearson Education, 2015.
4. D. C. Kulshreshtha, “Basic Electrical Engineering”, McGraw Hill, 2009.
5. L. S. Bobrow, “Fundamentals of Electrical Engineering”, Oxford University Press, 2011.
6. V. D. Toro, “Electrical Engineering Fundamentals”, Pearson Education.

Mathematics - II

Unit-I

Random variables and discrete probability distributions: Conditional probability, Probability
spaces, Discrete random variables, Independent random variables, Expectation of discrete random
variables, Sums of independent random variables, Moments, Variance of a sum, Correlation coefficient,

Chebyshev's Inequality, The multinomial distribution, Poisson approximation to the binomial
distribution, Infinite sequences of Bernoulli trials.

Unit-II

Continuous and Bivariate probability distribution: Continuous random variables and their properties,
Distribution functions and densities, Normal, Exponential and Gamma densities, Bivariate distributions
and their properties, Distribution of sums and quotients, Conditional densities, Bayes' rule.

Unit-III

Basic Statistics: Measures of Central tendency: Moments, Skewness and Kurtosis - Probability
distributions: Binomial, Poisson and Normal - evaluation of statistical parameters for these three
distributions; Correlation and regression – Rank correlation; Curve fitting by the method of least
squares- fitting of straight lines, second degree parabolas and more general curves.

Unit-IV

Applied Statistics: Test of significance: Large sample test for single proportion, difference of
proportions, single mean, difference of means, and difference of standard deviations; Small samples:

Test for single mean, difference of means and correlation coefficients; Test for ratio of variances - Chi-
square test for goodness of fit and independence of attributes.

Reference Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons.
2. P. G. Hoel, S. C. Port and C. J. Stone, Introduction to Probability Theory, Universal Book Stall.
3. S. Ross, A First Course in Probability, Pearson Education.

4. W. Feller, An Introduction to Probability Theory and its Applications, Wiley.
5. N.P. Bali and Manish Goyal, A text book of Engineering

Mathematics, Laxmi Publications.
6. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers.
7. Veerarajan T., Engineering Mathematics (for semester III), Tata McGraw-Hill Publishing Company
Limited.