Jharkhand University of Technology, Jharkhand
B.E./B.Tech CSE Sem 2 syllabus

Basic Electrical Engineering

BASIC ELECTRICAL ENGINEERING

Credit: 4

Module 1 : DC Circuits

Electrical circuit elements (R, L and C), voltage and current sources, Kirchoff current and voltage laws, analysis of simple circuits with dc excitation. Superposition, Thevenin and Norton Theorems. Time-domain analysis of first-order RL and RC circuits.

Module 2: 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. Three phase balanced circuits, voltage and current relations in star and delta connections.

Module 3: Transformers

Magnetic materials, BH characteristics, ideal and practical transformer, equivalent circuit, losses in transformers, regulation and efficiency. Auto-transformer and three-phase transformer connections.

Module 4: Electrical Machines

Generation of rotating magnetic fields, Construction and working of a three-phase induction motor, Significance of torque-slip characteristic. Loss components and efficiency, starting and speed

control of induction motor. Single-phase induction motor. Construction, working, torque-speed characteristic and speed control of separately excited dc motor. Construction and working of synchronous generators.

Module 5: Power Converters

DC-DC buck and boost converters, duty ratio control. Single-phase and three-phase voltage source inverters; sinusoidal modulation.

Module 6: Electrical Installations

Components of LT Switchgear: 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.

Programming for Problem Solving

PROGRAMMING FOR PROBLEM SOLVING

Credits:4

Module 1: Introduction to Programming
Introduction to components of a computer system (disks, memory, processor, where a program is
stored and executed, operating system, compilers etc.). Idea of Algorithm: steps to solve logical
and numerical problems. Representation of Algorithm: Flowchart/Pseudo code with examples.
From algorithms to programs; source code, variables (with data types) variables and memory
locations, Syntax and Logical Errors in compilation, object and executable code.

Module 2: Arithmetic expressions and precedence
Conditional Branching and Loops Writing and evaluation of conditionals and consequent
branching, Iteration and loops

Module 3: Arrays
Arrays (1-D, 2-D), Character arrays and Strings

Module 4: Basic Algorithms, Searching, Basic Sorting

Algorithms
(Bubble, Insertion and Selection), Finding roots of equations, notion of order of complexity
through example programs (no formal definition required)

Module 5: Function and Pointers
Functions (including using built in libraries), Parameter passing in functions, call by value,
Passing arrays to functions: idea of call by reference
Idea of pointers, Defining pointers, Use of Pointers in self-referential structures, notion of linked
list (no implementation).

Module 6: Recursion and Structure
Recursion, as a different way of solving problems. Example programs, such as Finding,
Factorial, Fibonacci series, Ackerman function etc. Quick sort or Merge sort.
Structures, Defining structures and Array of Structures

English

Module 1: Vocabulary Building 6 lecture
The concept of Word Formation, Root words from foreign languages and their use in English,
Acquaintance with prefixes and suffixes from foreign languages in English to form derivatives,
Synonyms, antonyms and standard abbreviations.

Module 2: Basic Writing Skills 6 lectures
Sentence Structures, Use of phrases and clauses in sentences,
Importance of proper punctuation,
Creating coherence, Organizing principles of paragraphs in documents, Techniques for writing
precisely.

Module 3: Identifying Common Errors in Writing 7 lectures
Subject-verb agreement, Noun-pronoun agreement, Misplaced modifiers, Articles, Prepositions,
Redundancies, Clichés.

Module 4: Nature and Style of sensible Writing 6 lectures
Describing, Defining, Classifying, Providing examples or evidence, Writing introduction and
conclusion

Module 5: Writing Practices 6 lectures
Comprehension, Précis Writing, Essay Writing,

Module 6: Oral Communication 7 lectures
(This unit involves interactive practice sessions in Language Lab)
Listening Comprehension, Pronunciation, Intonation, Stress and Rhythm, Common Everyday,
Situations: Conversations and Dialogues, Communication at Workplace, Interviews, Formal
Presentations.

Suggested Readings:

Practical English Usage. Michael Swan. OUP. 1995.
Remedial English Grammar. F.T. Wood. Macmillan.2007
On Writing Well. William Zinsser. Harper Resource Book. 2001
Study Writing. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press. 2006.
Communication Skills. Sanjay Kumar and Pushp Lata. Oxford University Press. 2011.
Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press