Veer Surendra Sai University of Technology, Odisha B.E./B.Tech CSE Sem 1 syllabus

Mathematics-I

MATHEMATICS

Calculus: Curve tracing, curvature, asymptotes

Ordinary differential equations: First order differential equations, separable equations, exact differential equations, and Bernoulli's equation, application to electric circuits.
Linear differential equations of second and higher order, homogeneous equations with constant coefficients, Euler Cauchy equations, solution by undetermined coefficients, solution by variation of parameters, modeling of electric circuits. Series solution of differential equation: Power series method, Legendre's equation, and Legendre's polynomial. Bessel's equation, Bessel's function) J (x n .

Laplace transformation: Laplace transformation and its use in solving differential equations. Convolution, integral equation.

Text Book:
1) Calculus: Gorakh Prasad
2) Advance Engineering Mathematics – E. Kreyszig, John Wiley & Sons Inc.
Chapter 1(1.1-1.7)
Chapter 2(2.1-2.10, 2.12)
Chapter 4(4.1-4.6)
Chapter 5(5.1-5.7)

Basic Electrical Engineering

BEG 1003 BASIC ELECTRICAL ENGINEERING

MODULE – I

I.DC Networks: Kirchhoff's laws, node and mesh analysis, Delta-star and star-delta transformations.
Superposition, Thevenin and Norton's theorem.
Transients, in R-L, R-C and R-L-C circuits with DC. excitation.

II.Single Phase AC Circuits: Single phase EMF generation, average and effective values of sinusoids, j operations, complex representation of impedances, phasor diagrams, power factor, power in complex notation, solution of series and parallel circuits.
Introduction to resonance in series RLC circuit.

MODULE – II

III. Three Phase AC Circuit: Three phase EMF generation, delta and star connection,
Line and Phase quantities. Solution of 2- phase circuits with balanced load. Power in 3-phase balanced circuits.

IV.Magnetic Circuits: B-H Curve, Hysteresis, Permeability and reluctance, solution of simple magnetic circuits, Hysteresis and Eddy current losses.

MODULE – III

V. DC Machines: Different types, Principle of Operation of D.C. generator EMF equation, methods of excitation.
D.C. Motor, Back e.m.f., speed and torque of a DC Motor, Conditions for maximum Power.
Speed control of D.C.. shunt motor.

VI.Transformers: Construction and Principle of operation of single phase transformer,
EMF equation,
Single phase autotransformer.

VII Three phase Introduction Motor: Construction and principle of operation, types;
Slip-torque characteristics.

VIII, Introduction to single-phase induction Motor.

MODULE – IV

IX. Electrical Measuring Instruments: DC PMMC instruments
Extension of range by shunts and multipliers.
Moving iron ammeters and voltmeters,
Dynamometer type Wattmeters,
Induction type Energy Meter.

X. Power supply systems: Principle of generation - thermal, hydel and nuclear. Transmission and distribution of electric energy.

Introduction to Electric Heating & Welding

TEXT BOOKS AND REFERENCES

1.Edward Hughes (revised by Ian McKenzie Smith). "Electrical & Electronics Technology" Pearson Education Limited. Indian Reprint 2002. Chapters 3,4,7,10, 11,12,13,14,34,35,39,41,47
2.H. Cotton" Advanced Electrical Technology"CBS Publishers, New Delhi, 7th Edition. Reprint-1999.
3.C.L. Wadhwa, “Electrical Engineering”, New Age International Publishers, 1st Edition revised 2006.
4.S. Parker Smith: “Problems in Electrical Engineering" Asia Publications,
5. J. J. Cathey , “Schaum's Outline of Basic Electrical Engineering” McGraw-Hill Professional,

Basic Electronics

BASIC ELECTRONICS

UNIT-1

Introduction to Electronics: Signals, frequency Spectrum of Signals, Analog and Digital Signals, Amplifiers, ICs.
Linear Wave Shaping Circuits: RC LPF, Integrator, HPF, Differentiator.
Properties of Semiconductors: Intrinsic, Extrinsic Semiconductors, Fermi Level, Current Flow in Semiconductors, Hall effects, Diffusion, Lifetime of minority Carriers.
Diodes: p-n junction theory, Current-Voltage characteristics, Analysis of Diode circuits, Rectifiers, Clippers, Clampers, Special diodes.

UNIT-II

Bipolar junction Transistor (BJTs): Physical Structures & Modes of Operation, Transistor Characteristics, DC analysis, Transistor switch, Introduction to Small Signal Analysis, The RC coupled amplifiers, Introduction to Power Amplifiers.
Field Effect Transistors (FETs): Physical Structures & Modes of Operation of MOSFETs, MOSFET Characteristics, DC Analysis.
Feedback Amplifiers & Oscillators: General Principles, Topologies, Properties of Negative Feedback, Barkhausen criteria for Oscillation.
Operational Amplifiers (OP-Amps): Ideal OP-AMP, Inverting Amplifier, Adder, Integrator, Differentiator, Non-Inverting Configuration.

UNIT-III

Digital Fundamentals: Binary Numbers, Decimal-to-Binary & Binary-

to-Decimal Conversion, Binary Addition, Subtraction, Multiplication and Division, Hexadecimal Number Systems, Logic Gates, Boolean Algebra, De Morgan's Theorems, Laws of Boolean Algebra, Flip flops, Shift Registers.

UNIT-IV
Cathode Ray Oscilloscope(CRO): Introduction, Cathode Ray Tube, Deflection Sensitivity, Waveform Display, A Basic Oscilloscope, CRO types, Application of CROs.
Digital Multimeters.
Principles of Communication: Fundamentals of AM & FM, Radio & TV Transmitters & Receivers, Basic Principles of Optical Fiber Communication.

TEXT BOOKS:
1. Microelectronics Circuits, A.S Sedra, K.C. Smith, Oxford University Press. Selected portions from chapters 1to 5, 8, 13.
2. Electronics Fundamentals and Applications, D Chattopadhyay and P.C. Rakshit, New Age International Publications. Selected portions from chapters 4 to 14, 16 to 20.

REFERENCE BOOKS:
1. Integrated Electronics, Millman and Halkias, Mc.Graw Hill Publications.
2. Electronic Devices & Circuit Theory, R.L Boylestad and L. Nashelsky, Pearson Education.

C & Data Structure

BCS 101 C & DATA STRUCTURE

Module 1: C Language Fundamentals, Arrays and Strings
Character set, Identifiers, Keywords, Data Types, Constant and Variables, Statements, Expressions, Operators, Precedence of operators, Input – output Assignments, Control structures, Decision making and Branching, Decision making & looping. Declarations, Manipulation & String-handling functions, Monolithic vs Modular programs, User defined vs standard functions, formal vs Actual arguments, Functions category, function prototypes, parameter passing, Recursion, Storage Classes: Auto, Extern, Global, Static.

Module 2: Pointers, Structures, Union & File handling
Pointer variable and its importance, Pointer Arithmetic, passing parameters, Declaration of structures, pointer to pointer, pointer to

structure, pointer to function, unions dynamic memory allocations, unions, file management.

Module 3: Development of Algorithms
Notations and Analysis, Storage structures for arrays-sparse matrices, Stacks and Queues: Representations and applications.

Module 4: Linked Lists
Singly linked lists – Linked stacks and queues – operations on Polynomials, Doubly Linked Lists – Circularly Linked Lists, Garbage collection and compaction.

Module 5: Binary Trees:
Binary Search Trees – General Trees – Tree Traversing – Operations on Binary Trees – Symbol Table construction – Height Balanced Trees.

Module 6: Graphs:
Representation of Graphs – Path Matrix – BFS, DFS – Shortest path problems.

Books:
1. E. Balaguruswamy “Programming in C”, Tata McGraw Hill
2. Data Structures Using C & C++, Yedidyah Langsam Moshe J, Augenstein, Aaron M.Tenenbaum, Prentice, Hall of India, New Delhi.

Reference Books:
1. Y.Kanetkar, “Let us C”, BPB Publications.
2. Fundamentals of Data Structure, in c by Hariwitz and Sahni & Anderson Freed, University Press.
3. Data Structures by S.Lipschutz, Schaum’s outline series in Computes.

English for Communication

Module – I
1.1 Communicative English, nature and process of communication
1.2 Communication and its elements: Message, sender, encoding, channel, receiver,
decoding, feedback
1.3 Barriers to communication
1.4 Types of communication: Intra-personal, Interpersonal, Group, Mass
Communication-verbal and non-verbal communication

1.5 Getting the message across: Audience, Subject, time and place and purpose
1.6 Different ways of communicating: Narrative, Description, Exposition and
argument, speaking and writing.

Module – II Communicative Grammar :
2.1 Time, tense and aspect
2.2 Verbs of state and event
2.3 Use of preposition
2.4 Expressing emotions and attitudes : Hope, anticipation of pleasure,
disappointment, approval, disapproval, surprise.

Module – III
The sounds of English (it is not a course in phonetics. Technical terms will not be
used except when absolutely necessary. Intensive speech practice in the Communication
Lab. Is recommended).
3.1 Length of vowels-long and short vowels
/ | /, / 3 : /, /a :/, / : /, /U : / | / / 2 /, /,/ Λ /, / O /, / U /
3.2 Consonants : / f, v, o, o, s, z, 3/
3.3 Stress pattern
3.4 Intonation : failing and rising

Module – IV English in context :
4.1 Functions of language : Descriptive, Expressive and Social
4.2 Bias-free language
4.3 Friendly communication-introductions, thanks, apologies, regrets, god wishes,
congratulations, offering help and food/beverage, farewells, condolences.

Books prescribed :
1. Oxford Guide to writing and speaking , John Seely, O.U.P
2. A Communicative Grammar of English, Leech, G.N. and Jan Svartvik

3. Better English Pronunciation, J.O
O’ Corner, Cambridge.

References :

1. Effective Technical Communication, M.Asraf Rizvi, Tata McGraw Hill
2. Technical Communication Today, Bovea et al. Pearson.