

**DETAILED SYLLABUS
FOR
BACHELOR OF SCIENCE [INFORMATION TECHNOLOGY] (BSc[IT])
(FOR BATCH 2002-2005)**



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BSC(IT) SYLLABUS**COURSE OBJECTIVES:**

This is a new course, and is designed as an attractive alternative to BCA. The course has two subsidiary subjects: Electronics and Mathematics. The course aims to develop strong foundations, suitable for further study, leading to an MSc (IT), a MCA degree, or even an MSc in Electronics or Mathematics. At the same time the course does not neglect basic computer skills, and the most important computer-related skills taught in BCA are covered in this course.

Like the BCA this course has been designed keeping in mind the desirable characteristics of a competent computer professional. We have identified these characteristics to be the following.

- ❑ Communication skills.
- ❑ Ability to work in a team.
- ❑ Logical and numerical ability.
- ❑ Knowledge of computers, consisting of
 - Strong fundamentals.
 - Programming methodology.
 - LAN and Internet.
 - Databases.
 - Application packages.

Strict standards would be maintained, to ensure quality. To enable such standards to be maintained, without undue hardship to the students, multiple exit options are provided. Students will be given a

- ❑ Certificate after successfully completing 1 year.
- ❑ Diploma after successfully completing 2 years.
- ❑ Degree after successfully completing 3 years.

Students who exit with a certificate or diploma will have the option to continue with the course on a part time basis, and to complete the course for a degree at their own pace.

Since computing is an applied field, it has been decided to increase the weightage of practical to 40% of the theory. Thus, each student will have 5 theory and 2 practical courses in each semester, except for the last semester, which would be wholly devoted to a project.

There would be a total of 25 papers and a project. The 25 papers would be divided as 10 in computers, 6 in Electronics, 6 in Mathematics, and 3 in English.

Eligibility Criteria: 10+2 with maths at the +2 stage.

SEMESTER-I

SUBJECT CODE	SUBJECT NAME	MARKS
1BSC1	FUNDAMENTALS OF COMPUTER & INFORMATION TECHNOLOGY	100
1BSC2	PROGRAMMING METHODOLOGIES USING 'C'	100
1BSC3	OPERATING SYSTEMS	100
1BSC4	BASIC ELECTRONICS - I	100
1BSC5	FUNDAMENTALS OF MATHEMATICS – I (ADVANCED CALCULUS AND MATRICES)	100
1BSC6	PRACTICAL 1: OS & PC PACKAGES	100
1BSC7	PRACTICAL 2: C PROGRAMMING	100
1BSC8	INTERNAL ASSESSMENT	100

SEMESTER-II

SUBJECT CODE	SUBJECT NAME	MARKS
2BSC1	DATA BASE MANAGEMENT SYSTEMS	100
2BSC2	DATA STRUCTURES AND ADVANCED C PROGRAMMING	100
2BSC3	BASIC ELECTRONICS & INSTRUMENTATION – II	100
2BSC4	FUNDAMENTALS OF MATHEMATICS – II	100

	(DISCRETE MATHEMATICS)	
2BSC5	COMMUNICATIVE ENGLISH – I	100
2BSC6	PRACTICAL 1: ACCESS + DATA STRUCTURES	100
2BSC7	PRACTICAL 2: DIGITAL LAB	100
2BSC8	SUMMER ASSIGNMENT	100
2BSC9	INTERNAL ASSESSMENT	100

SEMESTER-III

SUBJECT CODE	SUBJECT NAME	MARKS
3BSC1	OBJECT ORIENTED PROGRAMMING IN C++	100
3BSC2	COMPUTER NETWORKS & INTERNET	100
3BSC3	DIGITAL COMPUTER ORGANIZATION	100
3BSC4	FUNDAMENTALS OF MATHEMATICS – III (COUNTING PRINCIPLES, PROBABILITY AND STATISTICS)	100
3BSC5	COMMUNICATIVE ENGLISH – II	100
3BSC6	PRACTICAL 1: C++	100
3BSC7	PRACTICAL 2: NETWORKING & INTERNET	100
3BSC8	INTERNAL ASSESSMENT	100

SEMESTER-IV

SUBJECT CODE	SUBJECT NAME	MARKS
4BSC1	SYSTEM ANALYSIS & DESIGN	100
4BSC2	GUI PROGRAMMING IN VISUAL BASIC	100
4BSC3	COMPUTER ARCHITECTURE & MICROPROCESSORS	100
4BSC4	FUNDAMENTALS OF MATHEMATICS – IV (NUMERICAL METHODS)	100

4BSC5	COMMUNICATIVE ENGLISH – III	100
4BSC6	PRACTICAL 1: VISUAL BASIC	100
4BSC7	PRACTICAL 2: MICROPROCESSOR LAB	100
4BSC8	MINOR PROJECT	100
4BSC9	INTERNAL ASSESSMENT	100

SEMESTER-V

SUBJECT CODE	SUBJECT NAME	MARKS
5BSC1	JAVA PROGRAMMING	100
5BSC2	HARDWARE MAINTENANCE	100
5BSC3	DATA COMMUNICATION	100
5BSC4	FUNDAMENTALS OF MATHEMATICS – V (OPTIMISATION AND GRAPH THEORY)	100
5BSC5	MATHEMATICAL ANALYSIS	100
5BSC6	PRACTICAL 1: JAVA	100
5BSC7	PRACTICAL 2: HARDWARE MAINTENANCE	100
5BSC8	INTERNAL ASSESSMENT	100

SEMESTER-VI

SUBJECT CODE	SUBJECT NAME	MARKS
6BSC1	MAJOR PROJECT	500
6BSC2	INTERNAL ASSESSMENT	100

1BSC1-FUNDAMENTALS OF COMPUTERS AND INFORMATION TECHNOLOGY

UNIT-I

- ❑ Brief history of development of computers.
- ❑ Computer system concept.
- ❑ Computer system characteristics.
- ❑ Capabilities and limitations.
- ❑ Types of computers- Analog, Digital, Hybrid, General, Special Purpose, Micro, Mini, Mainframe and Super.
- ❑ Generations of computers.
- ❑ Personal Computer (PCs) - IBM PCs, characteristics, PC/PCXT/PCAT - configurations, Pentium and Newer PCs specifications and main characteristics.
- ❑ Types of PCs and their characteristics.
- ❑ Basic components of a computer system - Control unit, ALU, Input / Output functions and characteristics, memory - RAM, ROM, EPROM, PROM and other types of memory.

UNIT-II

- ❑ Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, Scanners, Digital Camera, MICR, OCR, OMR, Bar-codereader, Voice recognition, Light pen, Touch screen.
- ❑ Monitors - characteristics and types of monitor
- ❑ Printers - Daisy wheel, Dot Matrix, Inkjet, Laser, Line Printer.
- ❑ Plotter.
- ❑ Sound Card and Speakers.
- ❑ Storage fundamentals - Primary Vs Secondary.
- ❑ Data Storage and Retrieval methods
- ❑ Various Storage Devices - Magnetic Tape, Magnetic Disks, Cartridge Tape, Hard Disk Drives, Floppy Disks (Winchester Disk), Optical Disks, CD, VCD, CD-R, CD-RW, Zip Drive.

UNIT-III

- ❑ Need of Software, Types of Software - System software, Application software
- ❑ System Software - Operating System, Utility Program, Programming languages, Assemblers, Compilers and Interpreter
- ❑ Operating Systems - Functions, Types- Batch, Single, Multiprogramming, Multiprocessing

- ❑ Programming languages- Machine, Assembly, High Level, 4GL, their merits and demerits
- ❑ Application Software - Word-processing, Spreadsheet, Presentation Graphics, Data Base Management Software, characteristics, Uses and examples and area of applications of each of them.
- ❑ Computer Viruses, Virus working principals, Types of viruses, Virus detection and prevention, Viruses on network.

UNIT-IV

- ❑ Analog and Digital Signals
- ❑ Modulations - Amplitude Modular (AM), Frequency Modulation (FM), Phase Modulation (PM)
- ❑ Communication Process.
- ❑ Direction of Transmissions Flow - Simplex, Half Duplex, Full Duplex
- ❑ Communication Software, Communication Protocols, Communication Channels.
- ❑ Modem - Working and characteristics.
- ❑ Types of Connections - Dialup, Leased Lines, ISDN.
- ❑ Types of Network - LAN, WAN, MAN.
- ❑ Topologies of LAN - Ring, Bus, Star, Mesh and Tree topologies.
- ❑ Components of LAN - Media, NIC, Nos, Bridges, HUB, Routers, Repeater and Gateways.
- ❑ Use of Communication in daily life.

UNIT-V

- ❑ History & versions of DOS.
- ❑ DOS basics- Physical structure of disk, Drive name, FAT, File & directory structure and naming rules, Booting process, DOS system files.
- ❑ DOS commands
- ❑ Internal - DIR, MD, CD, RD, COPY, DEL, REN, VOL, DATE, TIME, CLS, PATH, TYPE .
- ❑ External - CHKDSK, XCOPY, PRINT, DISKCOPY, DISKCOMP, DosKey, TREE, MOVE, LABEL, APPEND, FORMAT, SORT, FDISK, BACKUP, EDIT, MODE, ATTRIB, HELP, SYS .
- ❑ Executable V/s Non executable files in DOS.

TEXTS & REFERENCE BOOKS :

- ❑ INTRODUCTION TO COMPUTERS AND INFORMATION TECHNOLOGY BY ANURAG SEETHA, RAM PRASAD & SONS, BHOPAL.
- ❑ COMPUTERS TODAY BY S.K.BASANDRA, GALGOTIA PUBLICATIONS.
- ❑ FUNDAMENTALS OF INFORMATION TECHNOLOGY BY ALEXIS LEON & MATHEWS LEON, VIKAS PUBLISHING HOUSE, NEW DELHI.
- ❑ DOS QUICK REFERENCE BY RAJEEV MATHUR, GALGOTIA PUBLICATIONS.

1BSC2 - PROGRAMMING METHODOLOGIES USING 'C'**UNIT-I**

- ❑ Program Concept, Characteristics of Programming, Various stages in Program Development, Program development aids -- Algorithms, Flow Charts - Symbols, Rules for making Flow chart , Types of flow-chart , Advantages & Disadvantages, Pseudo-codes, Decision Tree.
- ❑ Programming Techniques - Top down, Bottom up, Modular, Structured - Features, Merits & Demerits, Comparative study.
- ❑ Programming Logic- Simple, Branching.

UNIT-II

- ❑ Overview & Features of C, Structure of C program, Variables, Expressions, Identifiers, Keywords, Data Types and Constants.
- ❑ Operators : Arithmetic, Logical, Relational, Conditional and Bitwise Operators., Precedence and Associativity of Operators, Type conversion in expression.
- ❑ Single character input/output using getch(), getchar(). getch(), putchar(),
- ❑ Formatted input output using printf() and scanf(),
- ❑ Library functions - concepts, Mathematical & Character functions.

UNIT-III

- ❑ Control Statements : If statement, If...Else statement, Nesting of If... Else Statement, Else If ladder, The ?: operator, goto statement, Switch statement, Compound statement.
- ❑ Loop controls, Break, continue, goto statement.
- ❑ Single and Multi Dimensional arrays,
- ❑ Strings: declaration, initialization, functions.

UNIT-IV

- ❑ The need and form of C functions, User defined and library function.
- ❑ Function arguments, Return values and nesting of function.
- ❑ Recursion, Calling of functions, Array as function argument.
- ❑ Scope and life of variables - local and global variable, Storage class specifier - auto, extern, static, register.

UNIT-V

Structure and Unions in C, Defining structure, Declaration of structure variable, Accessing structure members, Nested structures, Array of structure, Structure assignment, Structure as function argument, Function that return structure, Union.

TEXTS & REFERENCE BOOKS :

- ❑ PROGRAMMING IN C BY E. BALAGURUSVAMY, TMH PUBLICATIONS.
- ❑ PROGRAMMING WITH C BY GOTTFRIED, SCHAUMS OUTLINE SERIES, TMH PUBLICATIONS.
- ❑ THINKING IN C BY MAHAPATRA, PHI PUBLICATIONS.
- ❑ COMPUTERS TODAY BY S.K.BASANDRA, GALGOTIA PUBLICATIONS.
- ❑ FUNDAMENTALS OF INFORMATION TECHNOLOGY BY ALEXIS LEON & MATHEWS LEON, VIKAS PUBLISHING HOUSE, NEW DELHI.
- ❑ PROGRAM DESIGN BY PETER JULIFF PHI PUBLICATIONS.
- ❑ 'O' LEVEL PROGRAMMING CONCEPTS & SYSTEMS BY V.K.JAIN, BPB PUBLICATIONS.

1BSC3 - OPERATING SYSTEMS (LINUX, WINDOWS 98, WINDOWS NT)

UNIT-I & II

LINUX: Basic Features, Advantages, Basic Architecture of Unix/Linux system, Kernel, Shell.

Linux File system-Boot block, super block, Inode table, data blocks, How Linux access files, storage files, Linux standard directories, Commands for files and directories cd, ls, cp, md, rm, mkdir, rmdir, more, less, creating and viewing files, using cat, checking disk free spaces. Linux system startup and shut-down process.

Understanding shells, Processes in linux, connecting processes with pipes, Redirecting input output, Background processing, managing multiple processes, changing process priority, scheduling of processes at command, batch commands, kill, ps, who, sleep, Printing commands, find, sort, Cal, banner, touch, file, file related commands-ws, sat, cut, grep, dd, etc, Mathematical commands- bc, expr, factor, units.

vi, joe, vim editor

UNIT III & IV-

Windows 98 : Windows concepts, features, windows structure, desktop, taskbar, start menu, my computer, Recycle Bin

Windows Accessories - Calculator, Notepad, Paint, wordpad, Character map

Windows Explorer - Creating folders and other Explorer facilities

Entertainment- CD player, DVD Player, media Player, sound Recorder, Volume Control

Managing Hardware & Software -Installation of Hardware & Software, Using Scanner

System Tools- Backup, Character map, clipboard viewer, Disk Defragmenter, Drive space, Scandisk, System Information , System Monitor , Drive converter (FAT 32)

Communication - Dial up Networking, Direct cable connection, Hyper terminal, Phone Dialer

Sharing Information between Programs

- ☐ Understanding OLE
- ☐ Embed/Link Using Cut and Paste
- ☐ Embed/Link Using Insert Object Manage Embedded/Linked Object

UNIT - IV

Windows NT : Introduction to Windows NT, Various Features, Differences with other Windows Environment and other O.S.s., Windows NT workstations Versus Server. Kernel and its Subsystems: Kernel/User Mode, Win32 Subsystem.

Security Models: System level restrictions, Server application security, Domain group access, Right and privilege verification, Application Support- Windows and Non Windows applications.

Requirement analysis for installation, Basic Hardware required, Workgroup and Domain concepts: PDC, BDC.

TEXT & REFERENCE BOOKS :

- ☐ Linux Complete by BPB Publications
- ☐ Learning Windows 98 step by step by Rajeev Mathur, BPB Publication
- ☐ The Complete Reference Windows NT – Griffith Wm. Kadnier – Tata McGraw-Hills.

1BSC4 - BASIC ELECTRONICS I

UNIT-I

Type of resistance, Resistance symbol, Color code capacitors, Capacitors symbol, Code types, Mica & paper capacitor, Inductance, Conductor, Insulator, Band theory, Intrinsic & extrinsic semiconductors., Theory of p-n junction, Capacitance & Diffusion capacitance.

UNIT-II

Zener diode, Tunnel diode, Varactor diode, Power diode, Photo diode, LED, LCD, Point contact diode, Schottky diode, Halfwave & fullwave rectifier with & without filter,.

UNIT-III

BJT characteristics, CE, CB, CC configurations, FET metal oxide, Semiconductors (MOSFET), CMOS, Unijunction transistor & Photo transistor.

UNIT-IV

Single stage RC coupled amplifier frequency response class A, class B, class AB, class C, Push pull amplifier, Efficiency distortion in amplifier their merits & demerits, BJT & FET RC coupled amplifiers.

UNIT-V

Switching characteristic BJT & FET, Monostable & astable Multivibrators, RC integrators & differentiators, Clipper & clamper circuit.

TEXT & REFERENCE BOOKS :

- ☐ BASIC ELECTRONICS BY B.L.THAREJA.
- ☐ BASIC ELECTRONICS BY A.K. SAHANI.
- ☐ BASIC ELECTRONICS BY V.K.MEHTA.

1BSC5-FUNDAMENTALS OF MATHEMATICS-I (ADVANCED CALCULUS AND MATRICES)

UNIT-I

- ❑ Definition of a function as a map between sets.
- ❑ Definition of a real valued function of a real variable.
- ❑ Graphical representation of a function as a curve in 2-dimensions.
- ❑ Equation of a straight line and of a curve.
- ❑ Tangent to a curve.
- ❑ Equations of tangent to a curve.
- ❑ Representation of real numbers on a computer.
- ❑ Graphical representation of a function on a computer screen.

UNIT-II

- ❑ Derivative as tangent to a curve.
- ❑ Continuity and differentiability.
- ❑ Definition of a limit, and derivative as a limit.
- ❑ Derivative as a linear map.
- ❑ Derivatives of products and composites: Leibniz rule and Chain rule.
- ❑ Applications to maxima and minima.
- ❑ Second derivative, and its use for testing extrema.
- ❑ Applications to root finding.

UNIT-III

- ❑ Integral as anti-derivative.
- ❑ Relation to integral as area under a curve.
- ❑ Integral as a limit.
- ❑ Integration by parts.
- ❑ Change of variables formula.
- ❑ Elementary techniques of numerical quadrature.

UNIT-IV

- ❑ Higher derivatives.
- ❑ Statement of Taylor's theorem in one variable.
- ❑ Euler-Maclaurin expansion and its applications to numerical computing.

- ❑ Difficulties in numerical computation of derivatives as limits.

UNIT-V

- ❑ Ordinary differential equations.
- ❑ Statement of Peano's existence theorem.
- ❑ Calculation of numerical solution by Euler's method.
- ❑ Basics of Runge-Kutta methods.

UNIT-VI

- ❑ Matrix algebra: addition and multiplication of matrices.
- ❑ Inverse of a non-singular matrix.
- ❑ Determinant of a matrix.
- ❑ Testing non-singularity using determinants.
- ❑ Solution of systems of linear equations using matrices and determinants.

TEXTS AND REFERENCE BOOKS :-

- ❑ ENGINEERING MATHEMATICS by S.S.SASTRY.

1BSC6 PRACTICAL 1: O S AND PC PACKAGES.

1BSC7 PRACTICAL 2: C PROGRAMMING.

2BSC1-DATABASE MANAGEMENT SYSTEM**UNIT-I**

DBMS CONCEPTS AND ARCHITECTURE : Operational data, Purpose of database system, Views of data, Data models: Relational, Network, Hierarchical, Instances & schemas, Data dictionary, Types of database languages: DDL, DML, Structure of a DBMS, Advantages & disadvantages of a DBMS.

DATABASE DESIGN : 3-level architecture proposal-External, Conceptual & Internal levels, Entity Relationship model as a tool of conceptual design: Entities & entity set, Relationship & relationship set, Attributes, Mapping constraints, Keys, Entity-Relationship diagram (E-R diagram): Strong & weak entities, Generalization, Specialization, Aggregation, Reducing E-R diagram to tables.

UNIT-II

RELATIONAL DATA MODEL : Set theory concepts and fundamentals: Relations, Domain, Attributes, Tuple, Concept of keys: Candidate key, Primary key, Alternate key, Super key, Foreign key, Fundamental integrity rules: Entity integrity, Referential integrity, Extension & Intension, Relational Algebra: Select, Project, Cross product, Different types of joins, Set operations, Structured Query Language (SQL), Codd's rules.

UNIT-III

RELATIONAL DATABASE DESIGN: Functional dependencies, Good & bad decomposition, Anomalies in a database- A consequences of bad design, Universal relation, Normalization: First, Second, Third & BCNF normal forms, Multivalues dependency, Join dependency & Fourth and Fifth normal form.

UNIT-IV

Indexing & Hashing-Basic Concepts, Indexing: B+ tree Index Files, B tree Index Files, Hashing: Static hash functions, Dynamic hash Functions, Index definition in SQL, Multiple key access.

UNIT-V

Recovery System, Failure classification, The storage hierarchy, Transaction model, Log based recovery, Buffer management, Shadow paging

TEXT & REFERENCE BOOKS:

- ❑ DATABASE SYSTEM CONCEPTS by HENRY F. KORTH & ABRAHAM SILBERSCHATZ.
- ❑ AN INTRODUCTION TO DATABASE SYSTEM by BIPIN C. DESAI.
- ❑ DATABASE MANAGEMENT SYSTEMS By LEON & LEON, VIKAS PUBLICATIONS.
- ❑ AN INTRODUCTION TO DATABASE SYSTEM by C. J. DATE.

2BSC2-DATA STRUCTURES AND ADVANCED C PROGRAMMING**UNIT-I**

POINTERS : Basic of pointers and operators, Pointers and function, Array of pointers, Pointers and strings, Pointers within structure.

DYNAMIC MEMORY ALLOCATION: Introduction, The process of memory allocation, Malloc (), Size of (), calloc (), free (), realloc ().

UNIT-II

FILE HANDLING: File structure, File handling functions, File types, File pointer fopen (), getc (), putc () and fclose (), feof (), fputs () and fgets (), Standard streams in C fread (), fwrite () and rewrite (), Direct access file fseek () and random access I/O fprintf () and fscanf (), command line arguments.

UNIT-III

DATA STRUCTURES : The concept of data structure, Abstract data structure, Analysis of algorithm.

STACKS: Introduction to stacks and primitive operation on stacks, Stack as an abstract data type, Multiple stacks, Stack application: infix, postfix, prefix and recursion.

QUEUES: Introduction to queues, Primitive operation on the queues, Queue as an abstract data type, Circular queue, De queue, Priority queue.

UNIT-IV

LINKED LIST: Introduction to the linked list of stacks, The linked list of queue, Header nodes, Doubly linked list, Circular linked list, Stacks and queues as a circular linked list, Application of linked list.

UNIT-V

TREES: Basic terminology, Binary tree, Tree representation as array and linked list, Binary tree representation, Traversal of binary trees: In order, pre order & post order, Application of binary tree, Threaded binary tree, B-tree & height balanced tree representation of B+ & B* trees, Binary tree representation of trees. Counting binary trees, Manipulating 2-3 trees.

SEARCHING AND SORTING: Sequential searching, Binary searching, Insertion sort, Selection sorts, Quick sort, Bubble Sort, Heap sort, Comparison of sorting method.

TEXT AND REFERENCE BOOKS:

- ❑ POINTERS THROUGH C by Y. KANITKAR.
- ❑ FUNDAMENTALS OF DATA STRUCTURE by S.SAWHNEY AND E. HOLOWITCH.
- ❑ DATA STRUCTURES by TRAMBLAY AND SORRENSON.
- ❑ DATA STRUCTURES (SCHAUM'S OUTLINE SERIES).
- ❑ DATA STRUCTURES by TANNENBAUM AND AUGENSTEIN.

2BSC3-BASIC ELECTRONICS & INSTRUMENTATION - II**UNIT-I**

CRT - display, The screen characteristics, CRO-CRT Construction, electrostatic gamma and magnetic deflection system, Deflection sensitivity regulated power supply, Shunt & series regulator, Emitter follower regulator, current regulator.

UNIT-II

Dual Trace & dual beam CRO, Sampling & digital read out CRO, Feedback amplifier, Oscillator, Current voltage feedback, Multistage feedback, Crystal oscillators.

UNIT-III

Direct-coupled amplifiers using BJT, JFET, Darlington configuration, Boot strapping, Series & shunt chopper, Differential amplifier.

UNIT-IV

Classification of transducers, Strain gauge displacement transducer, LVDT Thermo couple, Photoelectric transducer, Photo sensitive device, Magnetic transducer

UNIT-V

Digital measurement V/S analog measurement, D/A conversion method, A/D conversion method, Simultaneous conversion method, Successive approximation method, LED, LCD, Seven segment display, Alphanumeric display, IC555 Timer.

TEXT & REFERENCE BOOKS: -

- ❑ BASIC ELECTRONICS by B.L.THAREJA .
- ❑ BASIC ELECTRONICS by A.K. SAHANI .
- ❑ BASIC ELECTRONICS by V.K.MEHTA .

**2BSC4-FUNDAMENTALS OF MATHEMATICS-II
(DISCRETE MATHEMATICS)****UNIT-I**

Statements, logical connectives, truth table, tautologies, contradictions, logical equivalence, Applications to everyday reasoning.

UNIT-II

An axiom system for the sentence calculus. Truth tables as an effective procedure for deciding logical validity. Relation of sentence calculus to Boolean algebra.

UNIT-III

Quantifiers: Universal and existential quantifier. Predicate calculus, Axiom system for predicate calculus. Application to everyday reasoning.

UNIT-IV

Sets and classes, Relations. Equivalence relation and equivalence classes. Partial order relation, lub and glb. Trees and lattices. Mappings: injective, surjective and bijective mappings. Cardinality, Finite and infinite sets.

UNIT-V

Definition and basic properties of: semigroups and groups, rings, integral domains, and fields.

UNIT-VI

Vector spaces and algebra. Linear dependence and independence. Bases. Linear transformations and their representation as matrices. Invertible linear transformation and invertible matrix. Geometrical interpretation of determinant of a 2X2 matrix.

TEXT AND REFERENCE BOOKS:-

- ❑ DISCRETE MATHEMATICAL STRUCTURES by Bernard Kolman, Robert C. Busby, Sharon Ross.
- ❑ ENGINEERING MATHEMATICS by S.S.SASTRY .

2BSC5-COMMUNICATIVE ENGLISH-I

Objective: This course is designed on a predominantly communicative or interactive approach to the learning of English. This approach is based on the belief that language is not a body of knowledge to be learnt but a skill to be acquired. Student acquires the ability to use the language fluently effectively, correctly, confidently and naturally in real life situations that is to say, they imbibe and internalize the language. However, the approach is to encourage the learners to formulate and express their ideas and offer ample scope for creativity. The approach has been aimed at an integrator development of the four basic skills - Listening, speaking, reading and writing.

UNIT-I

Sentences: Simple, Compound, Complex, Assertive, Interrogative, Imperative, Exclamatory.

Clauses : Co-ordinate, Sub-ordinate, Relative, Adverb, Comparative (Adverb + Adjective)

Articles : Usage of 'A', 'AN' & 'THE'

Preposition : Position of Prepositions, Place Relations Time Relations and other relations.

UNIT-II**FUNCTIONAL GRAMMAR**

Tenses: Simple Present, Progressive Perfect , Present Perfect Progressive alongwith Past Tense and indications of futurity.

Reported speech Modals (Will, Shall Should, Would and others)

Voice : Active and Passive

UNIT-III

Reading

Comprehension: Written

Listening

Note taking/ Note making

UNIT-IV**VOCABULARY**

Words Commonly Misspells

Word formation by prefix suffix

UNIT-V

Literature : Lessons and Poems from M.P. Universities' 1st year Foundation Course book and Written Communication by Sarah Freeman.

TEXT BOOKS:

- ❑ English Language and Indian Culture - M.P.Universities' 1st year Foundation Course published by M.P. Hindi Granth Academy, Bhopal [Complete].
- ❑ Written Communication in English by Sarah Freeman published by Orient Longman [Units I and II only].

REFERENCE BOOKS:

- ❑ A Practical English Grammar by Thomson and Martinet.
- ❑ English Grammar by W.S.Allen.

2BSC6-PRACTICAL 1: ACCESS AND DATA STRUCTURES**2BSC7-PRACTICAL 2: DIGITAL LAB****2BSC8-MINI PROJECT**

3BSC1-OBJECT ORIENTED PROGRAMMING IN C++**UNIT-I**

Object Oriented Programming, Introducing C++ classes, Concepts of object oriented programming.

Classes, Structure & classes, Union & Classes, Friend function, Friend classes, Inline function, Scope resolution expression.

Static data member, Static member function, Passing objects to function, Returning objects, Object assignment.

UNIT-II

Array, Pointers references & The Dynamic Allocation operators, Array of objects, Pointers to object, Type checking C++ pointers, The This pointer, Pointer to derived types, Pointer to class members, Reference parameter, Passing references to objects, Returning reference, Independent reference, dynamic allocation operators, Initializing allocated memory, Allocating Array, Allocating objects.

Constructor & Destructor- Introduction, Constructor, Parameterized constructor, Multiple constructor in a class, Constructor with default argument, Copy constructor, Constructing two-dimensional Array, Destructor.

UNIT-III

Function overloading, Overloading constructor function finding the address of an overloaded function, Operator Overloading: Creating a member operator function, Creating Prefix & Postfix forms of the increment & decrement operators, Overloading the shorthand operation (i.e. +=, -= etc), Operator overloading restrictions, Operator overloading using friend function, Overloading New & Delete, [], (), -, comma operator, << .

UNIT-IV

Base class Access control, Inheritance & protected members, Protected base class inheritance, Inheriting multiple base classes, Constructors, destructors & Inheritance, When constructor & destructor function are executed, Passing parameters to base class constructors, Granting access, Virtual base classes .

Virtual function, Pure Virtual functions, Early Vs. late binding.

UNIT-V

The C++ I/O system basics: C++ streams, The basic stream classes: C++ predefined streams, Formatted I/O: Formatting using the ios members, Setting the format flags, Clearing format flags, An overloaded form of setf (), Examining the formatted flags, Setting all flags, Using width() precision() and fill(), Using manipulators to format I/O, Creating your own manipulators.

TEXT & REFERENCE BOOKS :

- ❑ C++ THE COMPLETE REFERENCE by HERBERT SCHILDT – TMH.
- ❑ C++ by BALGURUSWAMY – TMH.
- ❑ PROGRAMMING IN C++ By M.Kumar Tata McGraw Hill
- ❑ OBJECT ORIENTED PROGRAMMING C++ by R. LAFORE .
- ❑ OBJECT ORIENTED PROGRAMMING C++ by G. BLASCHEK.

3BSC2 - COMPUTER NETWORKING & INTERNET**UNIT-I**

Need & advantages of Networks , Types : server based , Peer based ,Hybrid.

Topology, Network media types, H/w protocol, Software protocol, digital signaling, analog signaling, bit synchronization, base band and broad band transmission.

UNIT-II

OSI and IEEE 802 Model, IEEE 802.3, IEEE 802.4, IEEE 802.5 & fast Ethernet FDDI, ATM, LAN access techniques , Bit map protocol , BRAP , adaptive walktree protocol , URN protocol .

UNIT-III

Connectivity, Hubs, Repeaters, Bridges, Multiplexers, Router and Brouter, Gateways, Simple installation and configuration of Windows NT, Modem, Types of modem, modulation schemes.

UNIT-IV

Internet v/s Intranet, growth of internet, ISP, Connectivity, Dial up leased line, URL, Domain name Portals Application, POP & Web based e-mail, merits ,IP address.

Basics of sending & receiving e-mails.

UNIT-V

FTP, Data transmission protocol.

Telnet, Remote logging, Internet chatting, WWW, HTTP, URL, HTML.

Java Script over view of e-commerce, Internet, e-business, Advantage of e-commerce, application feasibility & various constraints.

TEXT & REFERENCE BOOKS :-

- ❑ COMPUTER NETWORK by A.S.TANENBAUM.
- ❑ DATA COMMUNICATION AND NETWORKS by WILLIAM STALLINGS.
- ❑ COMMUNICATION AND NETWORKS by LEWIS MACKENZIE.
- ❑ DATA COMMUNICATION TODAY by STAN GELBER..
- ❑ DATA COMMUNICATION by WILLIAM J.BEYDA.
- ❑ DATA COMMUNICATION by PRAKASH G.GUPTA.
- ❑ DATA COMMUNICATION by SINGH & SAPRE.

3BSC3-DIGITAL COMPUTER ORGANISATION**UNIT-I**

DATA REPRESENTATION : Data types and Number systems ,Binary number system ,Octal & Hexa-decimal number system,1's & 2's complements, Binary Fixed- Point Representation, Arithmetic operation on Binary numbers, Overflow & underflow, Floating Point Representation, ASCII, EBCDIC codes, Gray code, Excess-3 & BCD, Error detection & correcting codes.

UNIT-II

DIGITAL LOGIC CIRCUITS : Logic Gates ,basic gates and their Truth tables, NOR, NAND & XOR gates, Boolean Algebra, Basic boolean Law's, Demorgan's theorem, MAP Simplification, Minimization techniques up to 4 variable K Map. Sum of Product & Product of Sums ,Combination & Sequential circuits, Half Adder & Full Adder, Full subtractor, Flip-flops-RS, D, JK & T Flip-flops, Shift Registers

UNIT-III

CPU ORGANIZATION: ALU & Control Circuit, Idea about Arithmetic Circuits, Program Control, Instruction Sequencing

UNIT-IV

INPUT-OUTPUT ORGANIZATIONS: I/O Interface ,Properties of simple I/O devices and their controller, Isolated versus memory-mapped, I/O, Modes of Data transfer, Synchronous & Asynchronous Data transfer., Handshaking, Asynchronous serial transfer, I/O Processor.

UNIT-V

MEMORY ORGANIZATION: Memory Hierarchy ,Auxiliary memory, Magnetic drum, Disk & Tape, Semi-conductor memories, Associative memory, Virtual Memory, Address space & Memory space, Address mapping, Page table, Page Replacement, Cache memory, Hit Ratio, Various mapping techniques, Writing into Cache.

TEXT & REFERENCE BOOKS :

- ❑ COMPUTER SYSTEM ARCHITECTURE by : MORRIS MANO .
- ❑ DIGITAL COMPUTER FUNDAMENTALS by BARTEE.
- ❑ DIGITAL COMPUTE ELECTRONICS by MALVINO.

3BSC4-FUNDAMENTALS OF MATHEMATICS-III (COUNTING PRINCIPLES, PROBABILITY AND STATISTICS)

UNIT-I

ELEMENTARY COUNTING PRINCIPLE : Product rule, Binomial and multinomial theorem, Stirling's formula, Principle of inclusion and exclusion, Permutations and combinations, Dearrangements, Marriage problem.

UNIT-II

RECURRENCES : Recurrences and generating functions, Solution of recurrences using generating functions

UNIT-III

DISCRETE PROBABILITY: Discrete probability, Applications of counting principles to calculate discrete probability.

UNIT-IV

PROBABILITY DISTRIBUTIONS: Definition of a random variable, Probability distribution and density function, Mathematical Expectation. mean, median, mode. Skewness and Kurtosis, Higher moments, Various probability distributions, Normal, Binomial, Poisson, and Cauchy distributions, and their properties.

UNIT-V

CORRELATION AND STATISTICAL INDEPENDENCE : Correlation and statistical independence, Conditional probability, Numerical generation of random variables with a given distribution, Statement of the central limit theorem, and numerical test of the central limit theorem.

UNIT-VI

Basics of sampling theory, Sample mean and variance, Sampling biases, with special reference to Intrnernet sampling, Stratified sampling.

UNIT-VII

Introduction to Monte Carlo methods

TEXTS & REFERENCE BOOKS :-

- ❑ DISCRETE MATHEMATICS FOR COMPUTER SCIENCE AND MATHEMATICIANS by JOE.L.MOTT , ABRAHAM KANDEL , T.P.BAKER.
- ❑ ENGINEERING MATHEMATICS by S.S.SASTRY

3BSC5-COMMUNICATIVE ENGLISH- III

Objectives: It has been observed that linguistic competence is essential to understand the basic concepts of various subjects. Therefore, this course is designed with an aim to make learners proficient and efficient in the use of English Language. A sincere effort is being made to expose the learners to the four basic linguistic skills - Listening, Writing, Speaking and Reading

UNIT-I

FUNCTIONAL GRAMMAR :

- ❑ Nouns : Countable, Uncountable
- ❑ Pronoun: Personal, Relative and others
- ❑ Verband Verb structures (infinitives and gerundals)
- ❑ Linking Devices

UNIT- II

FUNCTIONAL GRAMMAR :

- ❑ Adverbs and adverb phrases, Comparisons and Intensification
- ❑ Modifiers and adverbs
- ❑ Adjectives and Adjective Phrases

UNIT-III

VOCABULARY :

- ❑ Synonyms Antonyms & Homonyms
- ❑ Dimunitives and Derivatives
- ❑ Jargons or Registers

UNIT-IV

MECHANICS OF WRITING :

- ❑ Precis writing
- ❑ Paragraph
- ❑ Curriculum Vitae/ Resume
- ❑ Preparation of questionnaire for Interview skills

UNIT-V

LITERATURE FROM PRESCRIBED TEXTS :

TEXT BOOKS:

- ❑ English Language and Scientific Temper - M.P.Universities' 2nd year Foundation Course published by M.P.Hindi Granth Academy, Bhopal, [Complete].
- ❑ Written Communication in English by Sarah Freeman Published by Orient Longman [Units 3 and 4].

REFERENCE BOOKS:

- ❑ Intermediate English Grammar by Raymond Williams.
- ❑ Vocabulary by Michael McCarthy and Felicity O'Dell.
- ❑ English Grammar by Jayanthi Dakshina Murthy.

3BSC6-RACTICAL1 : C++**3BSC7-PRACTICAL2 : NETWORKING**

4BSC1-SYSTEM ANALYSIS & DESIGN**UNIT-I**

SYSTEM CONCEPTS : The system concept, Characteristics of system, Elements of system, Types of system, man made information systems.

SYSTEM DEVELOPMENT LIFE CYCLE : Recognition of need, Feasibility study, Analysis, Design implementation, post implementation and maintenance ,System planning and control .

UNIT-II

SYSTEM PLANNING AND INITIAL INVESTIGATION : Bases for planning system analysis ,Determining users requirements and analysis, Fact finding ,Determination of feasibility.

TOOLS OF STRUCTURED ANALYSIS: Logical and Physical models, Data flow diagram , Data dictionary, system structured charts ,system model. Pseudo codes, Decision tree, Decision tables, HIPO chart, Gantt charts, Warries diagram.

UNIT-III

FEASIBILITY STUDY : System performance constraints, identification of system objective, feasibility analysis and report.

COST / BENEFITS ANALYSIS : Data analysis, Cost/benefit analysis, categories, determination and system proposal.

UNIT-IV

SYSTEM DESIGN : Stages of system design ,Logical and physical design methods, Form driven mythologies, IPO and HIPO charts, structured walk through, Audit considerations: Processing controls, Data validation, Audit trail and documentation control.

UNIT-V

SYSTEM IMPLEMENTATAION: Input and output form design methodologies like prompts, menu, screen design, layout consideration, zoning box design, System testing and Quality

assurance, implementation and software maintenance, System security, Disaster, Recovery planning ,Ethics in system development.

TEXT & REFERENCE BOOKS :

- ❑ SYSTEM ANALYSIS AND DESIGN by E. M. AWARD.
- ❑ ANALYSIS AND DESIGN OF INFORMATION SYSTEM by J. SENU.
- ❑ THE ANALYSIS DESIGN AND IMPLEMENTATION OF INFORMATION by LUCAS.
- ❑ FUNDAMENTS OF SYSTEM ANALYSIS by J.F. GARALD AND A.F. GARALD.

4BSC2-GUI PROGRAMMING IN VISUAL BASIC

UNIT-I

The IDE of VB : Menu bar, Toolbar, Project explorer, Toolbox, Properties window, Form designer, Form layout, Immediate window.

Concept of VB project, Opening, renaming and saving the projects, Elements of the user interface, Designing the user interface. Creating forms and code modules, Running the application, Grouping controls, Event driven programming, Common properties methods and events.

Editor tab, format tab, general tab, docking tab, environment tab

UNIT-II

Variables, Declaring variables Type of variables, Converting variables type, User-defined data types, Special values, Forcing variables declarations, Scope and life time of a variable, Constants, Arrays, Types of arrays , Control array, Collections, Procedures, subroutines, functions, Control flow statements and conditional statements, Loop statements.

Working with Forms : Loading, Showing and hiding forms, Controlling one form within another, Using form templates, Designing menus and popup menus, Programming menu commands, Using access and shortcut keys, Using message box and input box, Using standard modules instead of form modules.

UNIT-III

ActiveX Controls, The Text Box Control, Properties, Methods and Event, Text selection, Search and replace operations, The List box and Combo box controls, Indexing with the List box controls, Searching a Sorted list, The scroll bar and slider controls, Using the common dialog controls, Color dialog box, Font common dialog box, The file open and save common dialog boxes, Print common dialog box, Help common dialog box, The file controls .

UNIT-IV

Components of VB : Classes, instances, objects, Encapsulation and abstraction, Derived classes and base classes, class in, Object linking and embedding (OLE).

Graphics in VB : Form, picture box and image box controls Sizing images, loading and saving images, Exchanging image through the clipboard, Coordinate systems, scale properties and methods, The drawing methods: drawing text, drawing , drawing boxes, filling, Drawing curves, manipulating pixels, specifying colors, Using timer controls

MDI Applications, MDI-built-in capabilities, MDI V/s SDI, Parent-child menus, Objects and instances, Loading and unloading of child forms, New and open commands

UNIT-V

Windows management, Graphics Device Interface, Accessing the Win32 API from VB, Dynamic-link-libraries (DLL), Declaring a DLL procedure, Calling a DLL procedure, Special considerations when calling DLL with special data types, The bitmaps and graphics API functions, System API functions

Interfacing with Office 97 : Programming with objects, The New VB for applications (VBA) Editor, Automating office applications, Spell-checking documents, Working with excel objects

TEXTS & REFERENCE BOOKS :

- ❑ VISUAL BASIC 6 by EVANGELOS PETROUTSOS, BPB PUBLICATIONS.
- ❑ BEGINNER'S GUIDE TO VISUAL BASIC 6 by REETA SAHOO & G. B. SAHOO, KHANNA PUBLISHING MASTERING HOUSE .
- ❑ PETER NORTON'S GUIDE TO VISUAL BASIC 6.
- ❑ BEGINNING VISUAL BASIC 6 by PETER WRIGHT, SHROFF PUBLISHERS.
- ❑ VISUAL BASIC 6 SUPER BIBLE by DAVID JUNG, TECHMEDIA PUBLICATION.

4BSC3-COMPUTER ARCHITECTURE & MICRO PROCESSORS

UNIT-I

COMPUTER SYSTEM : Computer Components, Computer function, Interconnection Structures, Bus Interconnection, PCI

UNIT-II

INTERNAL MEMORY & I/O : Computer memory system Overview, Semiconductor main memory, Cache memory, External devices, I/O Modules, Programmed I/O, Interrupt -Drives I/O, DMA, I/O channels & processors.

UNIT-III

INSTRUCTION SETS CHARACTERISTICS & FUNCTIONS : Machine Instruction Characteristics, Types of operands, Type of operations, Addressing, Instruction format

UNIT-IV

MICROPROCESSOR & ITS ARCHITECTURE : Microprocessor – based PC system, Internal Microprocessor architecture, Arithmetic coprocessor

UNIT-V

PENTIUM : Introduction to Pentium Microprocessor, Special Pentium registers, Pentium memory management, New Pentium instructions

TEXTS & REFERENCE BOOKS:

- ❑ COMPUTER ORGANIZATION & ARCHITECTURE - WILLIAM STALLINGS.
- ❑ INTEL MICROPROCESSORS – ARCHITECTURE, PROGRAMMING & INTERFACING - BARRY .B BREY.

4BSC4-FUNDAMENTALS OF MATHEMATICS – IV (NUMERICAL METHODS)

UNIT-I

Representation of numbers on computer, Differences between floating point and real arithmetic, Different types of errors and their estimates.

UNIT-II

Representation of a function on a computer, Discretisation, Table look-up interpolation, Extrapolation, Function evaluation, Numerical differentiation, Numerical Quadrature.

UNIT-III

Root finding and numerical maxima and minima, Solutions of nonlinear equations, Conjugate gradient method.

UNIT-IV

Solutions of linear equations, Gaussian elimination, Iterative methods, Eigenvalue problems.

UNIT-V

Integration of ordinary differential equations, Picard's method of successive approximation, Euler's method, Runge Kutta method, Predictor-Corrector method.

UNIT-VI

Introduction to integration of partial differential equations.

UNIT-VII

Introduction to integration of stochastic differential equations.

TEXT & REFERENCE BOOKS :

- ❑ NUMERICAL METHODS by S.S.SASTRY (VOLUME 2)
- ❑ NUMERICAL RECIPES IN C.

4BSC5-COMMUNICATIVE ENGLISH-III

Objectives: The course further exposes learners to the technicalities of English language. Innovative methods are required to make the learners comfortable with the language alongwith pair-work, Class room reading, Group discussion. Teachers can also give the learners to certain situations and ask them to interact accordingly to the given situation.

UNIT-I

Functional Grammar :

- ❑ Determiners
- ❑ Syntax
- ❑ Punctuations
- ❑ Common errors, analysis and corrections

UNIT-II

Vocabulary :

- ❑ Idioms and Phrases
- ❑ Foreign words and Phrases (Commonly used)
- ❑ Proverbs

UNIT-III

Writing skills :

- ❑ Expansion of a given idea
- ❑ Report writing (Intra/Inter Office)
- ❑ Essay writing
- ❑ Interpretation of Data chart

UNIT-IV

Writing skills :

- ❑ Advertisement- captions
- ❑ Slogans
- ❑ Memorandum
- ❑ Circulars, Notices
- ❑ Fax

UNIT-

- ❑ Literature from prescribed text

TEXT BOOKS:

- ❑ English Language and aspects of development - M.P.Universities' 3rd year Foundation Course published by M.P.Hindi Granth Academy, Bhopal [Complete]
- ❑ Written communication in English by Sarah Freeman published by Orient Longman [units 5,6 and 7]

REFERENCE BOOKS:

- ❑ Everyone's Guide to English Grammar (A new approach) by I Jayakaran
- ❑ Vocabulary by Wilfred Funk and Norman Lewis
- ❑ Common errors by T L Hsmith Pearse and Orient Longmans

4BSC6 - PRACTICAL1: VISUAL BASIC**4BSC7-PRACTICAL2 : MICROPROCESSOR LAB****4BSC8- MINOR PROJECT AT THE END OF SEMESTER IV****5BSC1-JAVA PROGRAMMING****UNIT- I**

C++ Vs JAVA, JAVA and Internet and WWW, JAVA support systems, JAVA environment, JAVA program structure, Tokens, Statements, JAVA virtual machine, Constants & Variables, Data Types, Type Casting , Operators , Expressions & its Evaluation, Decision making and branching , Loops, Jumps in Loops, Labeled Loops.

UNIT-II

Defining a class, Adding variables and methods, Creating objects, Accessing class members, Constructors, Method overloading , Static members, Nesting of methods, Inheritance: Extending a class, Overriding methods, Final variables and methods, Final classes, Finalizer methods, Abstract methods and classes, Visibility control .

UNIT-III

Arrays, One dimensional & two dimensional, Strings, Vectors, Wrapper classes, Defining interfaces, Extending interfaces, Implementing interfaces, Accessing interface Variables, System packages, Using system packages, Naming conventions, Creating packages, Accessing a package, Using package, Adding a class to a package, Hiding classes.

UNIT-IV

Threads, Creating threads, Extending the threads class, Stopping and blocking a thread, Life cycle of a thread, Using thread methods, Thread exceptions, Thread priority, Synchronization, Implementing the runnable interface.

UNIT-V

Applets, Local and remote applets, Applets Vs applications, Writing applets, Applets life cycle, Creating an executable applet, Designing a web page, Applet tag, Adding applet to HTML file, Running the applet, Passing parameters to applets, Aligning the display, HTML tags & applets, Getting input from the user.

TEXT & REFERENCE BOOKS :

- ❑ PROGRAMMING IN JAVA 2ND EDITION by E.BALAGURUSVAMY, TMH PUBLICATIONS .
- ❑ PETER NORTON GUIDE TO JAVA PROGRAMMING by PETER NORTON, TECHMEDIA PUBLICATIONS .

5BSC2-HARDWARE MAINTAINANCE**UNIT-I**

Visible PC components (Jumpers; DIP switches; other "basic" components)

Microprocessors (Internal MPU components & functions; Intel families: 286, 386, 486, early Pentiums, later Pentiums)

Power supplies (Connection to MB; connection to peripherals; failure; replacement)

RAM (Organization; packaging; newer technologies; installation issues; troubleshooting)

UNIT-II

Motherboards & BIOS (BIOS; POST; MB form factors; installation & replacement)

Expansion bus (I/O addressing; interrupts; COM & LPT ports; DMA; history of expansion bus architectures from then to now; rules of device installation)

Floppy drives (Preventive maintenance; repair)

Hard drives (non-SCSI) (Inside the drive; IDE/EIDE; HD types; Drive numbering; low-level format; partitioning; high-level format; fragmentation; troubleshooting; cabling; older drives)

SCSI (SCSI chain; SCSI standards; bus mastering; cabling and connectors; ASPI; performance; compatibility; troubleshooting and repair; SCSI versus EIDE)

UNIT-III

Modems (UARTs; protocols; flow control; error control; compression; standards; modem commands; connectors; fax modems; installation & troubleshooting)

Video (Monitor components & characteristics; troubleshooting monitors; video adapters; modes; resolution + color depth = memory; video memory technologies; video drivers)

Printers (Impact; ink-jet; laser; maintaining & troubleshooting; IEEE 1284 standard)

DOS (Operating systems; DOS user interface; CONFIG.SYS; device drivers; AUTOEXEC.BAT; TSRs; drive-related commands)

UNIT-IV

Windows 3.x (Modes; swap files; *.INI files; configuration; troubleshooting)

Windows 9x (registry; file structures; installation; device drivers; configuration; troubleshooting)

Optional; Time Permitting: Windows 2000 (Material to be included at instructor's discretion based on software availability, student interest, etc. Supplemental references will be provided)

UNIT-V

Portable PCs (General information; batteries; LCDs; PC Cards; Power management)

Multimedia (CD-ROM and related drives; sound)

TEXT AND REFERENCE BOOKS:

- ❑ Meyers, Michael, All-In-One A+ Certification Exam Guide, 2nd Edition, McGraw-Hill, ISBN 0-07-212266-8.
- ❑ Brooks, Charles, A+ Certification Training Guide, New Riders, ISBN 1-56205-896-7

5BSC3-DATA COMMUNICATION**UNIT-I**

Analog signal, Digital signal, Principles of analog modulation, Convolution, Correlation amplitude linear & angle modulation, Noise source, Signal distortion over communication channel, Baud rate, Bit rate, Base band channel, Broad band channel.

UNIT-II

Pulse modulation, Pulse amplitude modulation, Pulse time modulation, PCM, Differential PCM, Band width of PCM, Synchronous time division multiplexing, Asynchronous time division multiplexing

UNIT-III

Delta modulation, Adaptive data modulation, Flat top sampling, PWM, Principles of digital transmission, Digital phase shift keying, M-ary PSK, Packet switching, Circuit switching, Frame relay, Cell relay concept.

UNIT-IV

Comparison of DPSK & QPSK, M-ary FSK, Regenerative repeater, Line coding pulse shaping, High speed modem, Error correcting modem, Data compression in modem, Some standard modems – V.24, RS 232 interface, X.21 interface.

UNIT-V

Unit of Information, Entropy, Joint and conditional entropy, Information rate, Mutual information, channel capacity of BSC, Hamming distance, Block code, Cyclical redundancy check, Parity check.

TEXT & REFERENCE BOOKS :

- ❑ COMPUTER ORGANIZATION & ARCHITECTURE by WILLIAM STALLINGS.
- ❑ INTEL MICROPROCESSORS ARCHITECTURE, PROGRAMMING & INTERFACING by BARRY .B BREY.
- ❑ COMPUTER NETWORK by A.S.TANENBAUM.
- ❑ DATA COMMUNICATION AND NETWORKS by WILLIAM STALLINGS.
- ❑ COMMUNICATION AND NETWORKS by LEWIS MACKENZIE.
- ❑ DATA COMMUNICATION TODAY by STAN GELBER.
- ❑ DATA COMMUNICATION by WILLIAM J.BEYDA.
- ❑ DATA COMMUNICATION by PRAKASH G.GUPTA.
- ❑ DATA COMMUNICATION by SINGH & SAPRE.

5BSC5-MATHEMATICAL ANALYSIS**UNIT-I**

Cardinality reviewed, The number systems, Cauchy sequences, Real numbers, Complex numbers.

UNIT-II

Elements of metric spaces, Real numbers as a complete metric space, Bolzano-Weierstrass theorem.

UNIT-III

Sequences and series of real numbers, Convergence, Cauchy criterion, Ratio and root test for convergence of series.

UNIT-IV

Continuity, Relation to compactness, Statement of Heine-Borel theorem, Maxima and minima of a continuous function.

UNIT-V

Differentiability, Relation to continuity, Chain rule, Taylor's theorem, Infinite differentiability distinguished from analyticity, Example of an infinitely differentiable function which is not analytic, Complex analytic functions.

UNIT-VI

Riemann integral and its basic properties, Fundamental theorems of calculus.

UNIT-VII

Sequences and series of functions, Uniform convergence, Fourier coefficients and Fourier series.

TEXT & REFERENCE BOOKS :

- ❑ PRINCIPLES OF MATHEMATICAL ANALYSIS by RUDIN .
- ❑ INTRODUCTION TO MATHEMATICAL ANALYSIS by ROYDEN .

5BSC4- FUNDAMENTALS OF MATHEMATICS –V (OPTIMISATION AND GRAPH THEORY)

UNIT-I

- ❑ Review of finite dimensional vector spaces and linear transformations.
- ❑ Linear independence and bases. Matrix representation of a linear transformation. Translations and rotations in 3-d, and their matrix representations.
- ❑ Projections. Examples of orthogonal and perspective projections in 3-d and their matrix representations.

UNIT-II

- ❑ The vector space \mathbb{R}^n . Norm and distance.
- ❑ Inner product.
- ❑ Equation of a plane.
- ❑ Functions of several variables.
- ❑ Graphical representation of a function of two variables.
- ❑ Directional derivative.
- ❑ Normal to a surface and the total derivative.
- ❑ Gradient vector.
- ❑ Higher derivatives.
- ❑ Taylor's theorem for a function of n variables.

UNIT-III

- ❑ Gradient search techniques.
- ❑ Newton-Raphson method.
- ❑ Constrained maximization and Kuhn-Tucker conditions.
- ❑ Hessian and its use.

UNIT-IV

- ❑ Convex sets and extreme points.
- ❑ Extreme points and the simplex algorithm.
- ❑ Numerical implementation of the simplex algorithm.
- ❑ Graph Theory

UNIT-V

- ❑ Graphs, digraphs and trees.
- ❑ Subgraphs, isomorphism of graphs.
- ❑ Connectedness.
- ❑ Euler's formula.

UNIT-VI

- ❑ Konigsburg bridge problem.
- ❑ Eulerian graphs and Hamiltonian circuits.

UNIT-VII

- ❑ Minimal spanning trees.
- ❑ Representation of graphs on a computer.
- ❑ Adjacency matrix and transitive closure.

TEXT & REFERENCE BOOKS :

- ❑ DISCRETE MATHEMATICS FOR COMPUTER SCIENCE AND MATHEMATICIANS by JOE.L.MOTT, ABRAHAM KANDEL, T.P.BAKER
- ❑ ENGINEERING MATHEMATICS by S.S.SASTRY (VOLUME 2).

5BSC6PRACTICAL 1: JAVA

5BSC7PRACTICAL 2: HARDWARE MAINTENANCE

SEMESTER – VI

MAJOR PROJECT FOR THE DURATION OF 6 MONTHS