BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY
(B.Sc. Part - I Information Technology)
(Under the faculty of Science)

Semester-I

Paper no	Name of The subject	Total Marks	Theory per week	Practical per week
1.1	Modern Operating Environment-Part-I	50	4	
2.1	Programming through 'C'-Part-I	50	4	
3.1	File and data structure-Part-I	50	4	
4.1	Digital Electronics Part-I	50	4	
5.1	Foundation of Mathematics (Matrices & Calculus) Part-I	50	4	
6.1	Business Communication Part-I	50	4	
7.	Lab Course- Based on paper-1.1,2.1,and 3.1	--	--	2
8	Lab Course- Based on paper-4.1.	--	--	2
9	Lab Course- Based on paper-5.1	--	--	2
10	Lab Course-IV- Project and Viva	--	--	2

Semester-II

Paper no	Name of The subject	Total Marks	Theory per week	Practical per week
1.2	Modern Operating Environment-Part-II	50	4	
2.2	Programming through 'C'-Part-II	50	4	
3.2	File and data structure-Part-II	50	4	
4.2	Digital Electronics Part-II	50	4	
5.2	Foundation of Mathematics (Numerical Methods) Part-II	50	4	
6.2	Business Communication Part-II	50	4	
7	Lab Course- Based on paper-1.2,2.2,and 3.2	100	--	2
8	Lab Course- Based on paper-4.2.	100	--	2
9	Lab Course- Based on paper-5.2	100	--	2
10	Lab Course-IV- Project and Viva	100	--	2

Paper Number : 1.1
Paper Title : Modern Operating Environment - Part-I

Unit-1 Introduction

Evolution of computers, Computer generations, Basic Computer organization, classification and applications of computers, Concept of hardware, software and system.

Unit-2 Number Systems

Binary, octal, hexadecimal, Converting from one number system to another number system, computer codes- BCD, EBCDIC, ASCII, Gray Code, Excess-3, Binary arithmetic's – Addition, subtraction, multiplication, division

Unit-3 Computer Languages.

Need of languages Types of languages- machine dependent, machine independent, High-level, low-level, assembly level, their advantages and disadvantages, Translators- Interpreter, Compiler, Assembler.

Unit-4 Input output devices

Input devices- Keyboard, mouse, joystick, scanner, MICR, OMR, OCR, Output Devices- Screen, Printer, plotter,
Primary storage and secondary storage- RAM, ROM, PROM, EPROM, cache memory, floppy disk, hard disk, CD-ROM

Lab Course-

Demonstration of Windows Operating System
Desk Top, Icon, Task Bar, Windows Accessories-Notepad, Wordpad, Paint
Identification of various parts of Computer System
Printing various documents using printer

Reference Book

Computer Today- S. Basndara
Computer Fundamentals- P. K. Sinha
Ms- Office – Dreamtech Publication
Operating System – Godbole
Computer Fundamentals- V. Rajaraman
Introduction to Computer and Data Processing- Pawar, Lad, Shinde, Patil (Dreamtech)

Paper Number : 2.1
Paper Title : Programming Through 'C'- Part-I

Unit-1: Algorithm and flow charting:

Problem solving, algorithm characteristics, flow charting and different symbols used for flow charting

Unit-2:

Introduction to C programming:

Importance of 'C', basic structure of c program, process of compiling and running c program, character set, key words and identifiers, constants, variables, data types, declaration of variables and assign values, symbolic constant, operators and expressions.

Unit-3:

Managing input-output operations:

Reading and writing characters- getchar(), putchar()
Formatted input output- scanf(), Printf()

Unit 4:

Control Statements:

Decision making with – if, if Else, nesting of if else, switch statement
Looping – while, do while, for, breaking control statements- break, continue and goto statement.

Reference Book

Programming in ANSI C - E. Balagurusamy
Programming in C – Schuam outline Series
Let Us C – Yashwant Kanetkar
Introduction to Programming Using C- A. J Pawar, R. A. Lad, S. S. Shinde, D. R. Patil(Wiley-Dreamtech)

LabCourse

1. Simple programs using printf(), Scanf()
2. Programs based on if statements
3. Programs using switch statement

4. Programs based on While loops
5. Programs based on for loops
6. Programs based on do loops

Paper Number : 3.1
Paper Title : File and Data Structure - Part I

Unit-1 Introduction to data structure

Concept of data type , Data object ,Abstract data type, ADT for varying length character string.

Unit-2 File Organization

Concept of file, file organization, sequential, index and relative file organization, Fixed and variable length record.

Unit-3 Array as data structure

Definition, one and two dimensional array implementation, multi dimensional array, Primitive operations on array, concept of Parse matrix

Unit 4 Sorting and searching

Concept of sorting, types of sorting – Simple sort, Bubble sort, insertion sort and Radix sort, Sorting applications,
Searching- concept, linear search, binary search, searching applications.

Computer Lab Practical

1. Simple program using array to find frequency of each value within an array
2. Programs on matrices like add , sub and mul
3. Programs to manipulate Parse matrix
4 Programs on sorting methods (min one program on each method)
5. Programs to search element within using linear search.
6. Program to search element using binary search

Note : All programs to be written in 'C'

Reference Books-

Data Structure using c and c++ - L. A. Tenenbaum
Data Structure through c – Dr. Horowitz Sahani
Data Structure through c and c++ - Jagtap
Data Structure through C – Y. C. Kanetkar
Principle of database management system by J.D. Ullaman
Data Structure through C – V. K. Shukla

Paper 4.1 Digital Electronics-Part I

Unit-1 Number System

Binary, Decimal, Octal, Hexadecimal and their inter conversions.
Codes- BCD, Excess-3, Gray codes

Unit-2 Digital Signals and logic gates

Digital electronic signals and switches- concept of digital signal, logic levels, Active high, active low signals, Switching characteristics of semiconductor diode, Zener diode characteristics, transistor, Logic Gates- AND, OR, NOT, NOR, NAND, EX-OR, EX-NOR, operations and their truth table, Boolean algebra and reduction techniques using K-maps

Unit 3 Binary Arithmetic and electronic circuit

Arithmetic operations- Binary addition, subtraction, multiplication, division. 2's complement subtraction. Circuits- Half adder, full adder, half sutracter, full subtracter, 2 bit by 2 bit multiplier.

Unit 4 Multiplexers and de-multiplexers

Multiplexers- (MUX)-working of MUX, implementation of expressing using MUX, de-Multiplexers (DE-MUX)- implementation of expressing using DE-MUX, Decoder.

Paper – V Foundations of Mathematics

Semester – I (Matrices & Calculus)

Unit 1 – Matrices

1.1. Adjoint of matrix, Inverse of Matrix.
1.2. Application of matrices to a system of liner homogeneous and non-homogeneous equations.
1.3. Eigen values and Eigen vectors.

Unit 2 – Successive Differentiation

2.1. n^{th} order derivative of some standard functions : (i) $(ax + b)^n$, (ii) $\frac{1}{ax + b}$

(iii) Log(ax = b), (iv) e^{ax}, (v) a^{mx}, (vi) sin(ax + b), (vii) cos(ax + b),
(viii) $e^{ax}\sin(bx + c)$, (ix) $e^{ax}\cos(bx + c)$.

2.2. Leibnitz's theorem and it's applications.

Unit 3 – Mean Value Theorems

3.1. Introduction
3.2. Rolle's theorem.
3.3. Geometrical Interpretation of Rolle's theorem.
3.4. Lagrange's mean value theorem.
3.5. Geometrical Interpretation of Lagrange's mean value theorem.
3.2. Cauchy's mean value theorem.
3.3. Geometrical Interpretation of Cauchy's mean value theorem.

Unit 4 – Partial Differentiation

4.1. Introduction
4.2. Partial derivative of first order.
4.3. Partial derivative of Higher orders.
4.4. Homogeneous functions.
4.5. Euler's on homogeneous functions.

LAB COURSE – III
First Term

Sr. No.	Topics	No. Of Experiments
1	Inverse of Matrix by ad joint method	1
2	Solution of system of m liner homogeneous equations in n-unknowns	1
3	Solution of system of m linear non-homogeneous equations in n-unknowns	1
4	Eigen values and Eigen vectors	1
5	Solution of Non-linear equations – (a) Bisection Method (b) Method of False Position (c) Newton-Raphson Method	3
6	Interpolation – (a) Newton's Forward Difference Interpolation (b) Newton's Backward Difference	4

	Interpolation (c) Lagrange's Interpolation (d) Fitting a curve by Least square method- St. Line, Parabola	

Paper No. 6.1
Paper Title: Business Communication Part-I

Unit I :	What is business Communication? Communication process, Verbal and non-verbal communication, Barriers to Communication, 7 C's of effective communication	**(10 lecture)**
Unit II:	Business Correspondence, Letters of enquiry & reply to enquiry, letter to placing order and reply to order letter, complaint letter & reply to complaint letter, adjustment letters & reply to adjustment letters.	**(20 lecture)**
Unit III:	Negotiation Skills.	**(5 lecture)**
Unit IV:	Report writing- Formal, informal & Technical Reports	**(15 lecture)**

For Internal Evaluation

1]	Listening Skill: Listening of various programmers on TV, Radio, CDs, Cassettes ect. Testing of Listening Skill us should be done by asking questing on the above material	(**5 lecture)**
2]	Reading Skill: Reading of abridged & simplified various of Classics (by orient legman oxford Uty press, Mehata Publishing House etc.) English News Papers, Reader's Digest etc.	(**5 lecture)**

Semester- II

Paper Number : 1.2
Paper Title : Modern Operating Environment - Part-II

Unit-1 Introduction to Operating system

Definition of OS, Types of OS, Basic functions, features of OS, Comparison between DOS and Windows , Windows OS- concept of window, windows Explorer, control panel, managing files and folders.

Unit-2 Microsoft Word

Use and features and applications of Microsoft Word, Creating , formatting and printing the documents, Table option, mail merge

Unit-3 Microsoft Excel

Use and features and applications of Microsoft Excel, Creating , formatting and printing the worksheet, Formula, different functions and graphs

Unit-4 Network Basics and Internet

Network-Definition, Types, Network topologies, Concept of internet, uses and benefits of internet, search engines, handling e-mails

Reference Book

Computer Today- S. Basandara
Computer Fundamentals- P. K. Sinha
Ms- Office – Dreamtech Publication
Operating System – Achyut Godbole
Computer Fundamentals- V. Rajaraman
Introduction to Computer and Data Processing- Pawar, Lad, Shinde, Patil (Dreamtech)

Lab Course

1. Managing files and folders using windows Explorer
2. Managing desk top using control Panel and other utilities
3. Ms-word Creating letter, table, formatting documents
4. mail-merge
5. Creating and saving worksheets
6. Use of different formula and functions
7. creating worksheets and demonstrating various graphs
8. Opening new accounts on internet
9. Searching using various search engines
10. Composing and sending e-mails

Paper Number : 2.2
Paper Title : Programming Through 'C'- Part-II

Unit 1:

Array:

Definition, one and two dimensional array, declaration and initializing one and two dimensional array, multi dimensional array, Handling of character strings – Reading and writing strings- gets(), puts(), Putting strings together, comparison of two strings, String handling functions

Unit 2 :

User defined functions:

Need, multi functioned program, form of a c function, return value and their type, calling a function, category of a functions, functions with array Storage classes- auto, external, static and register

Unit 3 :

Pointers:

Understanding pointers, accessing address of variable, declaration and initializing pointers, pointer expression, pointer to array and functions, function call by value and by reference,

Unit 4:

Structures and Unions:

Defining and processing a structure, Defining and processing a Unions

Reference Book

Programming in ANSI C - E. Balagurusamy
Programming in C – Schuam outline Series
Let Us C – Yashwant Kanetkar

Introduction to Programming Using C- A. J Pawar, R. A. Lad, S. S. Shinde, D. R. Patil(Wiley-Dreamtech)

Lab Course

1. Programs based on array
2. Programs based on string handling
3. Programs based on user defined functions
4. Programs based on pointers
5. Programs based on Structure
6. Programs based on Unions

Paper : 3.2
Paper Title :File and Data Structure - Part II

Unit 1 Stack

Definition of stack and examples, , operations on stack, declaration of stack, infix, prefix and postfix concepts, stack applications.

Unit 2 Queues

Definition, queue as an ADT, implementation of queue, types of queue, operations on queue, Priority queue, queue applications

Unit 3 Link-list

Definition and concept of linked list, operations on linked list, linked list as stack and queue, circular and double linked list

Unit 4 Tree

Basic concepts of Tree, Binary tree, Types of Binary tree, representation, binary tree traversal, threaded binary trees, tree operations, tree applications

Computer Lab Practical

1. Programs on linked list, add, Remove node from linked list (Min 4 Program)
2. Programs on implementation of a circular list (Min 2 Program)
3. Programs on stacks Push and Pop (Min 2 Program)
4. Program on binary Tree (Min 2 program)
5. Program to implement linear queue.
6. Program to reverse linked list

Reference Books-

Data Structure using c and c++ - L. A. Tenenbaum
Data Structure through c – Dr. Sahani
Data Structure through c and c++ - Jagatap
Data Structure through C – Y. C. Kanetkar
Data Structure through C – V. K. Shukla(Wiley)

Paper 4.2 Digital Electronics-Part II

Unit 5 Flip- flop

Flip-Flop- concept of sequential circuit, S-R, J-K, preset and clear, master slave, JK-MS, D and T flip flops, their truth tables and excitation tables, conversion from one type to another type of flip flop. Registers. Logic families and their characteristics. Characteristics of digital IC's –7402, 7400, 7408, 7475, 7474.

Unit 6 Multi-vibrator

Types of Multivibrator, Block diagram of IC555, application of IC555 as Astable and Monostable (Calculation of frequency and pulse width) crystal clock using invertor. Clock circuit using NAND gate.

Unit 7 Introduction to Digital Memory

Types of memory- Volatile and non-volatile, SRAM and DRAM, classification and working principle of memory devices, RAM, ROM, PROM, EPROM, EEPROM.

Unit 8 Memory Organization

Concept of Diode matrix ROM, speed and cost range of memory devices, Memory organization- building the required memory size by using available memory chips, memory address map.

References:

Fundamentals Digital electronics- R. P. Jain, TMG
Digital Electronics – Derek Molly, PHI
Digital Electronics, An Introduction to theory and practice – William H. Gothmann

Electronics Lab Practical

1. Study of Basic Gates
2. Zener diode as a voltage regulator
3. Transistor as a switch
4. Inter conversion of gate by using NAND
5. Inter conversion of gate by using NOR
6. Verification of De-Morgan's Theorems
7. IC-555 as Astable Multivibrator
8. IC-555 as Mono stable Multivibrator
9. Study of D and edge triggered D flip flop
10. Study of R-S and J-K flip flop
11. Half and full Adder
12. Multiplexer and De-Multiplexer using IC's
13. Crystal clock using NAND gate
14. Architecture of 80386, 486 and Pentium system
15. Study of counter

Equivalence

Old syllabus	**New syllabus**
Digital Electronics	Digital Electronics Part I and Part II of Sem. I And II

Mathematics

Semester – II (Numerical Methods)

Unit 5 – <u>Errors in Numerical calculations and Solution to Algebraic and Transcendental Equations.</u>

5.1. Introduction
5.2. Errors
  5.2.1. Absolute Error.
  5.2.2. Relative Error.
  5.2.3. Percentage Error.

5.3. Solution to Algebraic and Transcendental Equations
- 5.3.1. Bisection Method.
- 5.3.2. Method of False Position.
- 5.3.3. Newton – Raphson Method

Unit 6 – Interpolation

6.1. Introduction.
6.2. Forward Difference.
6.3. Backward Difference.
6.4. Newton's Forward Difference Interpolation.
6.5. Newton's Backward Difference Interpolation.
6.6. Lagrange's Interpolation.
6.7. Least – Square Curve Fitting Method.
- 6.7.1. Fitting a straight line.
- 6.7.2. Fitting parabola.

Unit 7 – Solution of Simultaneous Algebraic Linear Equations

7.1. Cramer's Rule
7.2. Gauss Elimination Method.
7.3. Gauss – Jordan Method.
7.4. Gauss – Seidel Method.

Unit 8 – Numerical Solution of Ordinary Differential Equations & Numerical Integration

8.1. Numerical solution of 1st and 2nd order differential equations.
- 8.1.1. Taylor Series.
- 8.1.2. Euler's Method
- 8.1.3. Euler's Modified Method
- 8.1.4. Runge – Kutta Method (2^{nd}, 4^{th} order)

8.2. Numerical Integration.
- 8.2.1. Trapezoidal Rule.
- 8.2.2. Simpson's ⅓ Rule.
- 8.2.3. Simpson's ⅜ Rule.

Reference Books:

* Shanti Narayan : **Differential Calculus.**
* S.B. Nimse : **Calculus**
* H.T.Dinde, A.D. Lokhande, P.D.Sutar, U.H.Nai: **A Text Book Of Calculus And Differential Equations, Published by SUMS, 2003.**
* R.B. Kulkarni, J.D. Yadhav, N.I.Dhanshetti: **A Text Book Of Algebra And Geometry, Published by SUMS, 2003**
* G.V. Kumbhojkar, H.V. Kumbhojkar: **Calculus & Differential Equations, Nirali Prakashan.**
* S.S. Sastry: **Introduction Methods of Numerical Analysis, PHI.**
* V. Rajaraman: **Computer Oriented Numerical Methods.**
* Balguruswami: **Numerical Methods, PHI.**
* Mathews: **Numerical Methods for Scientist & Engineers, PHI.**
* S.S. Sastry: **Introduction Methods of Numerical Analysis, PHI.**
* Steven C: **Numerical Methods for Engineers with programming and Software Applications.**
* Richard L Burden, J Douglas Faires, Brooks/Cole, Thompson: **Numerical Analysis.**

Mathematics Lab Practical

Second Term

7	Solution of Simultaneous Algebraic Linear Equations (a) Gauss Elimination Method (b) Gauss – Jordan Method (c) Gauss – Seidel Method	3
8	Numerical solution of Ordinary Differential Equations (a) Euler' Method (b) Euler's Modified Method (c) Runge – Kutta Method (2^{nd} , 4^{th} order)	3
9	Numerical Integration (a) Trapezoidal Rule. (b) Simpson's □ Rule (c) Simpson's ⅜ Rule	3

Reference Books:

* Shanti Narayan : **Differential Calculus.**
* S.B. Nimse : **Calculus**
* S.P.Thorat, A.A.Basade, H.V.Patil : **A Hand Book Of Mathematics Laboratory – I, Published by SUMS, 2003.**
* S.S. Sastry: **Introduction Methods of Numerical Analysis, PHI.**
* V. Rajaraman: **Computer Oriented Numerical Methods.**
* Balguruswami: **Numerical Methods, PHI.**
* Mathews: **Numerical Methods for Scientist & Engineers, PHI.**
* S.S. Sastry: **Introduction Methods of Numerical Analysis, PHI.**
* Steven C: **Numerical Methods for Engineers with programming and Software Applications.**
* Richard L Burden, J Douglas Faires, Brooks/Cole, Thompson: **Numerical Analysis.**

Paper No. 6.2
Paper Title: Business Communication Part-II

Unit I :	Developing oral skills through interviews, group discussions & seminars etc.	**(07 lecture)**
Unit II:	Information transfer & interpretation of data	**(10 lecture)**
Unit III:	Modern office communication Notices, Agenda, minutes, letters related to appointments, letter of acceptance or joining report application letter for transfer	**(15 lecture)**
Unit IV:	Developing vocabulary and avoiding errors in written English	**(18 lecture)**

For Internal Evaluation

Spoken & written skills:

1]	Express Yourself (about family, friends, interests, ambitions etc.)	**(5 lecture)**

2]	Group discussions Interviews, telephonic conversation & Various communication situations, sending E-mail, power point presentation, etc.	**(5 lecture)**

List of Reference Books -		
1.	Handbook of Communication Skills in English	by R.L. Kulkarni (Phadke Prakashan, Kolhapur.)
2.	Business Communication	By Dr.Prakash M. Herekar (Mehta Publishing House Kolhapur)
3.	Communication for business : A Practical Approach	by Shirley Taylox (Pearson Education Ltd.)
4.	Business Communication	By Mary Allen Guffey
5.	Communication Skills for Engineers	(Pearson Education Ltd.)
6.	Learn Reading	By Sahrolyn Pollard Durodola (Anmol Publications Pvt. Ltd. New Delhi)
7.	Oral Skills by	G.V. Kulkarni
8.	English for Communication :A Test book of B.Sc.-I	(Shivaji University Press)
9.	English for Communication :A Test book of B.A.-III	(Shivaji University Press)
10	Effective Business Communication by Herta & Murphy.	H.W. Hildebrandl & J.P. Thomas (McGraw Hill)
11	www.usingenglish.com	
12	www.britishcouncil.org	

Scheme of Examination

Examination shall be conducted at the end of each semester. Written examination shall carry 40 marks.

Internal Evaluation shall carry 10 marks.

Structure:-

Semester – I

Paper No.	Name of the subject	Total Marks	Theory Per week
6.1	Business Communication Part- I	40 + 10	4

Semester – II

Paper No.	Name of the subject	Total Marks	Theory Per week
6.2	Business Communication Part- II	40 + 10	4

Equivalence in accordance with titles & contents of papers (for Revised Syllabus)

Sr.	Paper	Title of old paper	New Papers	Title of New paper

No.	No.		No.	
1	1	Business Communication	6.1	Business Communication Part- I
			6.2	Business Communication Part- II

(B.Sc. Part - I Information Technology)

(Under the faculty of Science)

Equivalence in accordance with titles and contents of papers (For Revised Syllabus)

SrNo	PaperNo	Title Of Old Paper	New Paper No	Title Of New Paper
1	1	Modern Operating Environment	1.1	Modern Operating Environment- Part-I
			1.2	Modern Operating Environment- Part-II
2	2	Programming Through 'C'	2.1	Programming Through 'C'-Part-I
			2.2	Programming Through 'C'-Part-II
3	3	File and Data Structure	3.1	File and Data Structure Part-I
			3.2	File and Data Structure Part-II
4	8	Lab Course-I Based On Paper-I	8	Lab Course-I Based On Paper-1.1,1.2,2.1,2.2,3.1,3.2
5	10	Lab Course-IV Project and Viva	10	Lab Course-IV Project and Viva