

Annexure No.	32 F
SCAA Dated	29.02.2008

**BHARATHIAR UNIVERSITY, COIMBATORE – 641 046**

**B. Sc COMPUTER SCIENCE**  
*For School of Distance Education*

**(Effective from the academic Year 2007-2008)**

**Scheme of Examinations (Non-semester)**

SUBJECTS	Duration	MAX. MARKS
<b>I YEAR</b>		
1. PART-I: Language-I	3	100
2. PART-II: Language-II(English)	3	100
3. Core 1: DIGITAL FUNDAMENTALS AND ARCHITECTURE	3	100
4. Core 2: DATA STRUCTURES AND C PROGRAMMING	3	100
5. Allied 1: MATHEMATICAL FOUNDATION FOR COMPUTER SCIENCE	3	100
<b>II YEAR</b>		
1. Core 3: C++ PROGRAMMING	3	100
2. Core 4: SYSTEM SOFTWARE AND OPERATING SYSTEM	3	100
3. Core 5: SOFTWARE ENGINEERING	3	100
4. Core 6: JAVA PROGRAMMING	3	100
5. Core Lab-1: PROGRAMMING LAB : C++ AND JAVA	3	100
<b>III YEAR</b>		
1. Core 7: COMPUTER NETWORKS	3	100
2. Core 8: RDBMS AND ORACLE	3	100
3. Core 9: VISUAL PROGRAMMING -VISUAL BASIC	3	100
4. Core 10: SOFTWARE TESTING	3	100
5. Core Lab-2 : PROGRAMMING LAB : VB AND ORACLE	3	100
Total Marks		1500

**YEAR I**  
**CORE 1 :DIGITAL FUNDAMENTALS AND ARCHITECTURE**

**Subject Description:** This subject deals with fundamentals of digital computers, Microprocessors and system architecture.

**Goal:** To learn about computer fundamentals and its organization.

**Objective:**

On successful completion of this subject the students should have :

- Knowledge on digital circuits
- Microprocessor architecture
- Interfacing of various components

**Unit I**

Number System and Binary Codes: Decimal, Binary, Octal, Hexadecimal – Binary addition, Multiplication, Division – Floating point representation, Complements, BCD, Excess3, Gray Code.

Arithmetic Circuits: Half adder, Full adder, Parallel binary adder, BCD adder, Half subtractor, Full subtractor, Parallel binary subtractor - Digital Logic: the Basic Gates – NOR, NAND, XOR Gates.

**Unit II**

Combinational Logic Circuits: Boolean algebra –Karnaugh map – Canonical form 1 – Construction and properties – Implicants – Don't care combinations - Product of sum, Sum of products, simplifications.

Sequential circuits: Flip-Flops : RS, D, JK, T - Multiplexers – Demultiplexers – Decoder – Encoder - Counters.

**Unit III**

**MICROPROCESSOR:** Architecture – Bus Organization – Functional diagram and pin out diagram of 8085 - Addressing modes of 8085 – Instruction set of 8085 – I/O Schemes – Peripherals and Interfaces.

**Unit IV**

Input – Output Organization: Input – output interface – I/O Bus and Interface – I/O Bus Versus Memory Bus – Isolated Versus Memory – Mapped I/O – Example of I/O Interface. Asynchronous data transfer: Strobe Control and Handshaking – Priority Interrupt: Daisy-Chaining Priority, Parallel Priority Interrupt. Direct Memory Access: DMA Controller, DMA Transfer. Input – Output Processor: CPU-IOP Communication.

**Unit V**

Memory Organization: Memory Hierarchy – Main Memory- Associative memory: Hardware Organization, Match Logic, Read Operation, Write Operation. Cache Memory: Associative, Direct, Set-associative Mapping – Writing Into Cache Initialization. Virtual Memory: Address Space and Memory Space, Address Mapping Using Pages, Associative Memory Page Table, Page Replacement.

**Text Books:**

1. Digital Electronics Circuits and Systems, V.K. PURI, TATA McGRAW-HILL Pub. Company
2. Computer System Architecture, M. MORRIS MANO, Pearson Education Pub, III Edition.

**Reference Books:**

1. Digital principles and applications, Albert Paul Malvino, Donald P Leach, McGrawHill, 1996.
2. Computer Architecture, Carter, Schaums outline series, TMH.

## CORE 2 : DATA STRUCTURES AND C PROGRAMMING

### Subject Description:

This subject deals with the methods of data structures using C programming language.

**Goal:** To learn about C programming language using data structural concepts.

### Objective:

On successful completion of this subject the students should have :

- Writing programming ability on data structures dealing with Stacks, Queues, List, Searching and Sorting algorithms etc.,

### UNIT – I:

Programming development methodologies – Programming style – Problem solving techniques: Algorithm, Flowchart, Pseudocode - Structure of a C program – C character set – Delimiters – Keywords – Identifiers – Constants – Variables – Rules for defining variables – Data types – Declaring and initializing variables – Type conversion. Operators and Expressions – Formatted and Unformatted I/O functions – Decision statements – Loop control statements.

### UNIT – II:

Arrays – String and its standard functions.

Pointers – Functions – Preprocessor directives: #define, #include, #ifndef, Predefined macros.

### UNIT – III:

Structure and Union: Features of structure, Declaration and initialization of structure, Structure within structure, Array of structure, Pointer to structure, Bit fields, Enumerated data types, Union.

Files: Streams and file types, Steps for file operation, File I/O, Structures read and write, other file functions, Command line arguments, I/O redirection.

### UNIT – IV:

Linear data structures: Introduction to data structures – List: Implementations, Traversal, Searching and retrieving an element, Predecessor and Successor, Insertion, Deletion, Sorting, Merging lists – Stack: Representation, Terms, Operations on stack, Implementation.

Single linked list, Linked list with and without header, Insertion, Deletion, Double linked list – Queues: Various positions of queue, Representation

### UNIT V:

Searching and Sorting – Searching: Linear, Binary.

Sorting – Insertion, Selection, Bubble, Quick, Tree, Heap.

### TEXT BOOK:

Ashok N Kamthane, “PROGRAMMING AND DATA STRUCTURES” – Pearson Education, First Indian Print 2004, ISBN 81-297-0327-0.

### REFERENCE BOOK:

E Balagurusamy: Programming in ANSI C, Tata McGraw-Hill, 1998.

1. Ellis Horowitz and Sartaj Sahni: Fundamentals of Data Structure, Galgotia Book Source, 1999.
2. Data structure using C – Aaron M Tanenbaum, Yedidyeh langsam, Moshe J Augenstein, PHI.

## **ALLIED 1 : MATHEMATICAL FOUNDATIONS FOR COMPUTER SCIENCE**

### **Subject Description:**

This subject deals with mathematical concepts like matrices, numerical analysis and statistical methods for computer science and applications

### **Goal:**

To learn about the mathematical structures for computer applications.

### **Objective:**

On successful completion of this subject the students should have:

- Understanding the concepts of mathematics
- Learning applications of statistical and numerical methods for computer science

### **Unit I**

Matrices – Introduction – Determination – Inverse of a matrix – Rank of a Matrix - Eigen value Problems

### **Unit II**

Set theory-Introduction-Set & its Elements-Set Description-Types of sets-Venn-Euler Diagrams- Set operations & Laws of set theory-Fundamental products-partitions of sets-minsets-Algebra of sets and Duality-Inclusion and Exclusion principle

### **Unit III**

Mathematical logic – Introduction- propositional calculus –Basic logical operations-Tautologies-Contradiction-Argument-Method of proof- Predicate calculus.

### **Unit IV**

Relations – Binary Relations – Set operation on relations-Types of Relations – Partial order relation – Equivalence relation – Composition of relations – Functions – Types of functions – Invertible functions – Composition of functions.

### **Unit V**

Graph Theory – Basic terminology – paths, cycle & Connectivity – Sub graphs - Types of graphs – Representation of graphs in compute memory - Trees – Properties of trees – Binary trees – traversing Binary trees – Computer Representation of general trees.

### **Text Book:**

1. Engineering Mathematics Volume II – Dr M.K. Venkataraman – NPC (Unit I)
2. Discrete Mathematics – J.K. Sharma Second Edition – 2005 , Macmillan India Ltd.

### **Reference Books:**

1. Discrete Mathematics Structures with Applications to computer science - J. P Tremblay R Manohar – Mc Graw Hill International Edition.
2. Discrete Mathematics – Dr M. K. Venketaramen, Dr N.Sridharan, N. Chandarasekaran – The National publishing Company Chennai.

**YEAR II****CORE 3 : C++ PROGRAMMING**

**Subject Description:** This subject deals with Object-oriented programming concepts like Abstraction, Encapsulation, Inheritance and Polymorphism.

**Goal:** Knowledge on Object-oriented concept and programming with C++.

**Objective:** To inculcate knowledge on Object-oriented programming concepts using C++.

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**UNIT-I:** Introduction to C++ - key concepts of Object-Oriented Programming –Advantages – Object Oriented Languages – I/O in C++ - C++ Declarations. Control Structures: - Decision Making and Statements : If .. else ,jump, goto, break, continue, Switch case statements - Loops in C++ : For, While, Do - Functions in C++ - Inline functions – Function Overloading.

**UNIT-II :** Classes and Objects : Declaring Objects – Defining Member Functions – Static Member variables and functions – array of objects –friend functions – Overloading member functions – Bit fields and classes – Constructor and destructor with static members.

**UNIT-III**

Operator Overloading: Overloading unary, binary operators – Overloading Friend functions – type conversion – Inheritance: Types of Inheritance – Single, Multilevel, Multiple, Hierarchical, Hybrid, Multi path inheritance – Virtual base Classes – Abstract Classes.

**UNIT-IV:**

Pointers – Declaration – Pointer to Class , Object – this pointer – Pointers to derived classes and Base classes – Arrays – Characteristics – array of classes – Memory models – new and delete operators – dynamic object – Binding , Polymorphism and Virtual Functions.

**UNIT-V:**

Files – File stream classes – file modes – Sequential Read / Write operations – Binary and ASCII Files – Random Access Operation – Templates – Exception Handling - String – Declaring and Initializing string objects – String Attributes – Miscellaneous functions .

**TEXT BOOKS :**

1. Ashok N Kamthane , OBJECT-ORIENTED PROGRAMMING WITH ANSI AND TURBOC C++, Pearson Education publication. 2003.

**REFERENCE BOOKS:**

- 1.E. Balagurusamy, OBJECT-ORIENTED PROGRAMMING WITH C++, Tata Mc-Grawhill Publication, 1998.
2. Maria Litvin & Gray Litvin , C++ for you, Vikas publication, 2002.
3. John R Hubbard, Programming with C, 2<sup>nd</sup> Edition, TMH publication, 2002.

## **CORE-4: SYSTEM SOFTWARE AND OPERATING SYSTEM**

### **UNIT- I**

Introduction –System Software and machine architecture-Assemblers-Basic assembler functions - Machine dependent features-program relocation-Machine independent features – literals - symbol defining statements-expressions-program blocks-control sections and program linking - Assembler design options-one pass assemblers-multi pass assemblers.

Loader and Linkers: Basic Loader Functions - Machine dependent loader features – relocation – program – linking - Machine independent loader features - Automatic Library search - Loader options - Loader design options - linkage editor - dynamic linking - Bootstrap loader.

### **UNIT- II**

Macroprocessor: Basic macroprocessor functions - Machine independent macroprocessor features - concatenation of macro parameter macro processor design options-recursive macro expansion - general purpose macro processor - macro processing within language translators.

Text Editors: Overview of editing process - user interface - editor structure.

### **UNIT-III**

Machine dependent compiler features - Intermediate form of the program-Machine dependent code optimization-machine independent compiler features-Compiler design options-division into passes-interpreters-p –code compilers-compiler-compilers.

### **UNIT IV**

Introduction: Definition of DOS – History of DOS – Definition Of Process - Process states - process states transition – Interrupt processing – interrupt classes - Storage Management Real Storage: Real storage management strategies – Contiguous versus Non-contiguous storage allocation – Single User Contiguous Storage allocation- Fixed partition multiprogramming – Variable partition multiprogramming.

Virtual Storage: Virtual storage management strategies – Page replacement strategies – Working sets – Demand paging – page size.

### **UNIT V:**

Processor Management Job and Processor Scheduling: Preemptive Vs Non-preemptive scheduling – Priorities – Deadline scheduling - Device and Information Management Disk Performance Optimization: Operation of moving head disk storage – Need for disk scheduling – Seek Optimization – File and Database Systems: File System – Functions – Organization – Allocating and freeing space – File descriptor – Access control matrix.

### **TEXT BOOK:**

1. Leland –L-Beck, “System Software-An Introduction to Systems Programming”, Pearson Education Publishers, Third Edition-2003.

## CORE-5: SOFTWARE ENGINEERING

**Subject Description:** This subject deals with Software Engineering concepts like Analysis, Design, Implementation, Testing and Maintenance.

**Goal:** Knowledge on how to do a software project with in-depth analysis.

**Objective:** To inculcate knowledge on Software engineering concepts in turn gives a roadmap to design a new software project.

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**UNIT-I: Introduction to Software Engineering:** Definitions – Size Factors – Quality and Productivity Factors. **Planning a Software Project:** Planning the Development Process – Planning an Organizational Structure.

**UNIT-II: Software Cost Estimation:** Software cost Factors – Software Cost Estimation Techniques – Staffing-Level Estimation – Estimating Software Estimation Costs.

**UNIT-III: Software Requirements Definition:** The Software Requirements specification – Formal Specification Techniques. **Software Design:** Fundamental Design Concepts – Modules and Modularization Criteria.

**UNIT-IV:** Design Notations – Design Techniques. **Implementation Issues:** Structured Coding Techniques – Coding Style – Standards and Guidelines – Documentation Guidelines.

**UNIT-V: Verification and Validation Techniques:** Quality Assurance – Walkthroughs and Inspections – Unit Testing and Debugging – System Testing. **Software Maintenance:** Enhancing Maintainability during Development – Managerial Aspects of Software Maintenance – Configuration Management.

### TEXTBOOK:

1. **SOFTWARE ENGINEERING CONCEPTS** – Richard Fairley, 1997, TMH.  
(UNIT-I: 1.1-1.3,2.3-2.4    UNIT-II: 3.1-3.4    UNIT III: 4.1-4.2,5.1-5.2  
UNIT-IV: 5.3-5.4,6.1-6.4    UNIT-V: 8.1-8.2, 8.5-8.6, 9.1-9.3)

### REFERENCE BOOKS:

1. **Software Engineering for Internet Applications** – Eve Anderson, Philip Greenspun, Andrew Grumet, 2006, PHI.
2. **Fundamentals of SOFTWARE ENGINEERING** – Rajib Mall, 2<sup>nd</sup> edition, PHI
3. **SOFTWARE ENGINEERING** – Stephen Schach, 7<sup>th</sup> edition, TMH.

## **CORE-6: JAVA PROGRAMMING**

**Subject Description:** This subject deals with Java Programming concepts.

**Goal:** Enable to create wide range of Applications and Applets using Java.

**Objective:** To inculcate knowledge on Java Programming concepts.

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**UNIT-I:** Fundamentals of Object-Oriented Programming: Object-Oriented Paradigm – Basic Concepts of Object-Oriented Programming – Benefits of Object-Oriented Programming – Application of Object-Oriented Programming. Java Evolution: History – Features – How Java differs from C and C++ – Java and Internet – Java and www –Web Browsers. Overview of Java: simple Java program – Structure – Java Tokens – Statements – Java Virtual Machine.

**UNIT-II:** Constants, Variables, Data Types - Operators and Expressions – Decision Making and Branching: if, if ..else, nested if, switch, ? : Operator - Decision Making and Looping: while, do, for – Jumps in Loops - Labeled Loops – Classes, Objects and Methods.

**UNIT-III:** Arrays, Strings and Vectors – Interfaces: Multiple Inheritance – Packages: Putting Classes together – Multithreaded Programming.

**UNIT-IV:** Managing Errors and Exceptions – Applet Programming – Graphics Programming.

**UNIT-V:** Managing Input / Output Files in Java : Concepts of Streams- Stream Classes – Byte Stream classes – Character stream classes – Using streams – I/O Classes – File Class – I/O exceptions – Creation of files – Reading / Writing characters, Byte-Handling Primitive data Types – Random Access Files.

### ***TEXTBOOKS:***

1. **PROGRAMMING WITH JAVA – A PRIMER - E. Balagurusamy**, 3<sup>rd</sup> Edition, TMH.

### ***REFERENCE BOOKS:***

1. **THE COMPLETE REFERENCE JAVA 2 - Patrick Naughton & Hebert Schildt**, 3<sup>rd</sup> ed, TMH
2. **PROGRAMMING WITH JAVA – John R. Hubbard**, 2<sup>nd</sup> Edition, TMH.



**CORE LAB 1: PROGRAMMING LAB : C++ AND JAVA****C++:**

1. Write a C++ Program to create a class to implement the Data Structure STACK. Write a constructor to initialize the TOP of the STACK. Write a member function PUSH ( ) to insert an element and member function POP ( ) to delete an element check for overflow and underflow conditions..
2. Write a C++ Program to create a class FLOAT that contains one float data member. Overload all the four Arithmetic operators so that they operate on the object FLOAT.
3. Write a C++ Program to create class, which consists of EMPLOYEE Detail like E-Number, E-Name, Department, Basic, Salary, and Grade. Write a member function to get and display them. Derive a class PAY from the above class and write a member function to calculate DA, HRA and PF depending on the grade.
4. Write a C++ Program to create a class SHAPE which consists of two VIRTUAL FUNCTIONS Calculate Area ( ) and Calculate Perimeter ( ) to calculate area and perimeter of various figures. Derive three classes SQUARE, RECTANGLE, TRIANGE from class Shape and Calculate Area and Perimeter of each class separately and display the result.
5. Write a C++ Program to check whether the given string is a palindrome or not using Pointers.
6. Write a C++ Program to create a File and to display the contents of that file with line numbers.

**JAVA:**

1. Write a Java Program to implement the concept of multiple inheritance using Interfaces.
2. Write a Java Program to implement the concept of multithreading with the use of any three multiplication tables and assign three different priorities to them.
3. Write a Java Program to draw several shapes in the created windows.
4. Write a Java Program to create a frame with four text fields name, street, city and pin code with suitable tables. Also add a button called “my details”, When the button is clicked its corresponding values are to be appeared in the text fields.
5. Write a Java Program to create Menu Bars and pull down menus.
6. Write a Java Program which open an existing file and append text to that file.

**YEAR III****CORE 7: COMPUTER NETWORKS**

**Subject Description:** This subject deals different Network concepts like Layers, Wireless Concepts, Transmission and Security.

**Goal:** Knowledge on Computer Networks and technologies like broadband and Bluetooth.

**Objective:** To inculcate knowledge on Networking concepts and technologies like wireless, broadband and Bluetooth.

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**UNIT-I: Network Hardware:** LAN – WAN – MAN – Wireless – Home Networks. **Network Software:** Protocol Hierarchies – Design Issues for the Layers – Connection-oriented and connectionless services – Service Primitives – The Relationship of services to Protocols. **Reference Models:** OSI Reference Model – TCP/IP reference Model – Comparison of OSI and TCP/IP -Critique of OSI and protocols – Critique of the TCP/IP Reference model.

**UNIT-II: PHYSICAL LAYER - Guided Transmission Media:** Magnetic Media – Twisted Pair – Coaxial Cable – Fiber Optics. **Wireless Transmission:** Electromagnetic Spectrum – Radio Transmission – Microwave Transmission – Infrared and Millimeter Waves – Light Waves. **Communication Satellites:** Geostationary, Medium-Earth Orbit, Low Earth-orbit Satellites – Satellites versus Fiber.

**UNIT-III: DATA-LINK LAYER:** Error Detection and correction – Elementary Data-link Protocols – Sliding Window Protocols. **MEDIUM-ACCESS CONTROL SUB LAYER:** Multiple Access Protocols – Ethernet – Wireless LANs - Broadband Wireless – Bluetooth.

**UNIT-IV: NETWORK LAYER:** Routing algorithms – Congestion Control Algorithms. **TRANSPORT LAYER:** Elements of Transport Protocols – Internet Transport Protocols: TCP.

**UNIT-V: APPLICATION LAYER:** DNS – E-mail. **NETWORK SECURITY:** Cryptography – Symmetric Key Algorithms – Public Key Algorithms – Digital Signatures.

**TEXTBOOKS:**

1. **COMPUTER NETWORKS** – Andrew S. Tanenbaum, 4<sup>th</sup> edition, PHI.  
(UNIT-I:1.2-1.4 UNIT-II:2.2-2.4 UNIT-III:4.2-4.6 UNIT-IV:5.2,5.3,6.2,6.5 UNIT-V:7.1,7.2,8.1-8.4)

**REFERENCE BOOKS:**

1. **DATA COMMUNICATION AND NETWORKS** – Achyut Godbole, 2007, TMH.  
2. **COMPUTER NETWORKS Protocols, Standards, and Interfaces** – Uyles Black, 2<sup>nd</sup> ed, PHI.

## CORE-8: RDBMS AND ORACLE

**Subject Description:** This subject deals with RDBMS concepts using Oracle SQL and PL/SQL.

**Goal:** Knowledge on Oracle Programming techniques.

**Objective:** To inculcate knowledge on RDBMS concepts and Programming with Oracle.

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**UNIT-I: Database Concepts: A Relational approach:** Database – Relationships – DBMS – Relational Data Model – Integrity Rules – Theoretical Relational Languages. **Database Design: Data Modeling and Normalization:** Data Modeling – Dependency – Database Design – Normal forms – Dependency Diagrams - Denormalization – Another Example of Normalization.

**UNIT-II: Oracle9i: Overview:** Personal Databases – Client/Server Databases – Oracle9i an introduction – SQL \*Plus Environment – SQL – Logging into SQL \*Plus - SQL \*Plus Commands – Errors & Help – Alternate Text Editors - SQL \*Plus Worksheet - iSQL \*Plus. Oracle Tables: DDL: Naming Rules and conventions – Data Types – Constraints – Creating Oracle Table – Displaying Table Information – Altering an Existing Table – Dropping, Renaming, Truncating Table – Table Types – Spooling – Error codes.

**UNIT-III: Working with Table: Data Management and Retrieval:** DML – adding a new Row/Record – Customized Prompts – Updating and Deleting an Existing Rows/Records – retrieving Data from Table – Arithmetic Operations – restricting Data with WHERE clause – Sorting – Revisiting Substitution Variables – DEFINE command – CASE structure. **Functions and Grouping:** Built-in functions – Grouping Data. **Multiple Tables: Joins and Set operations:** Join – Set operations.

**UNIT-IV: PL/SQL: A Programming Language:** History – Fundamentals – Block Structure – Comments – Data Types – Other Data Types – Declaration – Assignment operation – Bind variables – Substitution Variables – Printing – Arithmetic Operators. **Control Structures and Embedded SQL:** Control Structures – Nested Blocks – SQL in PL/SQL – Data Manipulation – Transaction Control statements. **PL/SQL Cursors and Exceptions:** Cursors – Implicit & Explicit Cursors and Attributes – Cursor FOR loops – SELECT...FOR UPDATE – WHERE CURRENT OF clause – Cursor with Parameters – Cursor Variables – Exceptions – Types of Exceptions.

**UNIT-V: PL/SQL Composite Data Types:** Records – Tables – Varrays. **Named Blocks:** Procedures – Functions – Packages – Triggers – Data Dictionary Views.

### **TEXTBOOKS:**

1. **DATABASE SYSTEMS USING ORACLE – Nilesh Shah**, 2<sup>nd</sup> edition, PHI.  
(UNIT-I: Chapters 1 & 2    UNIT-II: Chapters 3 & 4    UNIT III: Chapters 5 & 6  
UNIT-IV: Chapters 10 & 11    UNIT-V: Chapters 12,13 & 14)

### **REFERENCE BOOKS:**

1. **DATABASE MANAGEMNET SYSTEMS – Arun Majumdar & Pritimoy Bhattacharya**, 2007, TMH.
2. **DATABASE MANAGEMETN SYSTEMS – Gerald V. Post**, 3<sup>rd</sup> edition, TMH.

## **CORE-9: VISUAL PROGRAMMING - VISUAL BASIC**

**Subject Description:** This subject deals Visual Basic Programming concepts.

**Goal:** Knowledge on Visual Programming and how to develop a Project.

**Objective:** To inculcate knowledge on Programming and Project Development using Visual Basic.

**UNIT-I: Introducing Visual Basic:** What is VB? – Event and Event Procedures – Object-related concepts –VB program Development Process – Required Computer Skills – Logical Program Organization -VB Program Components – VB environment – Opening, Saving, Running a VB Project – Getting Help – Sample VB project. **Visual Basic Fundamentals:** Numeric, String constants – Variables – Data Types and Declarations – Operators and Expressions –Hierarchy of Operations – Inserting Parentheses – Special Rules concerning Numeric Expressions – String Expressions - Assigning Values to Variables – Displaying out – Library Functions - Program Comments. **Branching and Looping:** Relational operators and Logical Expressions – Branching with If-Then, If-Then-Else blocks – Selection Select Case – Looping with For-Next, Do-Loop, While-Wend – Stop statement.

**UNIT-II: Visual Basic control Fundamentals:** Control tools – Control tool Categories – Working with Controls – Naming Forms and Controls – Assigning Property values to Forms and Controls – Executing commands – Displaying Output – Entering Input Data – Selecting Multiple Features, Exclusive Alternatives, Form from a List - Assigning Properties collectively – Generating Error Messages – Creating timed Events – Scroll Bars.

**UNIT-III: Menus and Dialog Boxes:** Building Drop-Down Menus – Accessing Menu from Keyboard – Menu Enhancements – Submenus – Pop-Up Menus – Dialog Boxes – more about MsgBox Function – The Input Box function. **Executing and Debugging a New Project:** Syntax errors – Logical errors – Setting Breakpoints – Defining Watch Values – Stepping Through a Program – User-induced Errors – Error-handlers – Generating a Stand alone Executable Program.

**UNIT-IV: Procedures:** Modules and Procedures – Sub Procedures – Event Procedures – Function Procedures – Scope – Optional Arguments. **Arrays:** Characteristics – Declarations – Processing – Passing Arrays to Procedures – Dynamic Arrays – Array-related Functions – Control Arrays – Looping with for Each-Next.

**UNIT-V: Data Files:** Characteristics – Accessing and Saving a File in VB: The Common Dialog Control – Processing a Data file – Sequential Data Files – Random-Access Data files – Binary files.

### **TEXTBOOK:**

1. **VISUAL BASIC – Byron S. Gottfried**, Schaum's Outline series, TMH.  
(UNIT-I: Chapters 1, 2 & 3 UNIT II: Chapter 4 UNIT-III: Chapter 5 & 6 UNIT-IV: Chapters 7 & 8 UNIT V: Chapter 9)

### **REFERENCE BOOK:**

1. **The Complete reference VISUAL BASIC – Noel Jerke**, TMH.

## CORE 10: SOFTWARE TESTING

**Subject Description:** This subject deals software testing concepts like unit-wise testing, integration testing and acceptance testing.

**Goal:** Knowledge on software testing and how to test the software at various levels.

**Objective:** To inculcate knowledge on Software testing concepts.

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**UNIT-I: Software Development Life Cycle models:** Phases of Software project – Quality, Quality Assurance, Quality control – Testing, Verification and Validation – Process Model to represent Different Phases - Life Cycle models. **White-Box Testing:** Static Testing – Structural Testing –Challenges in White-Box Testing.

**UNIT-II: Black-Box Testing:** What is Black-Box Testing? - Why Black-Box Testing? – When to do Black-Box Testing? – How to do Black-Box Testing? – Challenges in White Box Testing - **Integration Testing:** Integration Testing as Type of Testing – Integration Testing as a Phase f Testing – Scenario Testing – Defect Bash.

**UNIT-III: System and Acceptance Testing:** system Testing Overview – Why System testing is done? – Functional versus Non-functional Testing - Functional testing - Non-functional Testing – Acceptance Testing – Summary of Testing Phases.

**UNIT-IV: Performance Testing:** Factors governing Performance Testing – Methodology of Performance Testing – tools for Performance Testing – Process for Performance Testing – Challenges. **Regression Testing:** What is Regression Testing? – Types of Regression Testing – When to do Regression Testing – How to do Regression Testing – Best Practices in Regression Testing.

**UNIT-V: Test Planning, Management, Execution and Reporting:** Test Planning – Test Management – Test Process – Test Reporting –Best Practices. **Test Metrics and Measurements:** Project Metrics – Progress Metrics – Productivity Metrics – Release Metrics.

### TEXTBOOKS:

1. **SOFTWARE TESTING Principles and Practices – Srinivasan Desikan & Gopalswamy Ramesh**, 2006, Pearson Education.

(UNIT-I: 2.1-2.5, 3.1-3.4    UNIT-II: 4.1-4.4, 5.1-5.5    UNIT III: 6 .1-6.7

(UNIT IV: 7.1-7.6, 8.1-8.5    UNIT-V: 15.1-15.6, 17.4-17.7)

### REFERENCE BOOKS:

1. **EFFECTIVE METHODS OF SOFTWARE TESTING–William E.Perry**, 3<sup>rd</sup> ed, Wiley India.

2. **SOFTWARE TESTING – Renu Rajani, Pradeep Oak**, 2007, TMH.

## CORE LAB-2: PROGRAMMING LAB : VB & ORACLE

### VISUAL BASIC

1. Write a simple VB program to accept a number as input and convert them into
  - a. Binary
  - b. Octal
  - c. Hexa-decimal
2. Write a simple VB program to add the items to list box with user input and move the selected item to combo box one by one.
3. Write a simple VB program to develop a calculator with basic operation.
4. Design an form using common dialog control to display the font, save and open dialog box without using the action control property.
5. Write a simple program to prepare a Questionnaire.
6. Write a VB Program to develop a menu driven program  
Add a MDI window in the form and arrange them in the cascading/horizontal style using menus (Create a menu to add form, arrange) (Menu Item 1).  
Also change the form color using the menu in another menu item (Menu Item 2).

### ORACLE

#### Data Definition Basics

7. Create the following table  
cat\_head, route\_head, place\_head, route\_detail, Ticket\_detail, ticket\_head  
with the mapping given below:
 

cat_head	route_head
(cat_code PK)	(cat_code FK)
route_head	route_detail
(route_id PK)	(route_id FK)
ticket_head	ticket_detail
(tick_no PK)	(tick_no FK)
place_head	route_detail
(place_id PK)	(place_id FK)

  - (i) Alter the table ticket\_header to add a check constraint on ticket\_no to accept values between 1 and 500
  - (ii) Alter table route\_header to add a column with data type as long.

Continued.....

#### Data Manipulation Basics

8. (a) Insert values to above tables  
(b) Display only those routes that originate in madras and terminate at cochin  
(c) Display only distinct category code from the table route\_header in descending manner.

- (d) Update the table route\_header to set the distance between madras and coimbatore as 500

#### Queries

9.

- a. Select rows from ticket\_details such that ticket number greater than any ticket\_number in ticket\_header.
- b. Select rows from route\_header such that the route\_id are greater than all route\_id in route\_detail wher place id is "100".
- c. Create view tick from ticket\_header with Ticket\_no, Origin, Destination , route\_id

#### Report

10. Generate a report from the table ticket\_detail for the particular ticket\_no

#### PL/SQL

11.

- a. Write a PL/SQL block to update the bus\_station to be "ERODE" where place\_id is '01' or '05' [place\_header]
- b. Write a PL/SQL block to satisfy the following condition by accepting the route\_id as user input. If the distance is less than 500 than update the fare to be 200
- c. Write a Database trigger before insert for each row on the table route\_detail not allowing transaction on Saturday / Sunday
- d. Write a Database trigger before delete for each row not allowing deletion and give the appropriate message on the table route\_details

### **PROJECT**

12. Develop a Simple Project for Student Database Management System using VB as front end and ORACLE as back end