

1. Vision of the University

To provide quality education to reach the un-reached

2. Mission of the University

- To conduct research, teaching and outreach programmes to improve conditions of human living.
- To create an academic environment that honours women and men of all races, caste, creed, cultures and an atmosphere that values intellectual curiosity, pursuit of knowledge, academic freedom and integrity.
- To offer a wide variety of off-campus educational and training programs, including the use of information technology, to individuals and groups.
- To develop partnership with industries and government so as to improve the quality of the workplace and to serve as catalyst for economic and cultural development.
- To provide quality/inclusive education, especially for the rural and un-reached segments of economically downtrodden students including women, socially oppressed and differently abled.

3. Vision of the Programme

- To provide quality education to the students community and develop them with skills attitude and leadership quality
- To bridge the gap between industry and institution by upgrading curricula and syllabi based on industrial and societal needs(Establish Industry Institute Interaction \ program to enhance corporate expectations)
- Encourage research based projects in the emerging areas of technology convergence.
- To provide suitable environments to develop pioneering talents, practice ethical values and train as permanent learners.

4. Mission of the Programme

- To educate students at under graduate level (BCA) in the fundamental and advanced concepts of computing discipline.
- To foster practical skills in our students with an emphasis on ethics, interpersonal development and professional competency.
- To prepare them to pursue exemplary careers in industries, academia and research.
- To impart the ability to use the expertise in computing to meet the ever growing demands of the society.

5. Preamble

Bachelor of Computer Applications (BCA) is a 3 – Year Under Graduate Programme Spread over Six semesters. This Programme is designed to bridge the gap between IT industries and Academic institutes by incorporating the latest development, into the Curriculum and to give students a complete understanding within a structured framework. This Programme helps the students to build-up a successful Career in Computer Science and for pursuing Higher Studies in Computer Science.

6. Programme Educational Objectives (PEOs)

PEO1: To enhance knowledge in critical areas of Computer Applications and Industrial Computing.

PEO2: To enrich analytical skills of students besides synthesis involved in the field of Computer Applications.

PEO3: To strengthen student's aptitude and ability to cope up with academic demands.

7. Programme Outcomes (POs)

PO1: Computational information: Appreciate and apply mathematical organization, computing and domain information for the conceptualization of computing models from clear harms.

PO2: Difficulty Analysis: Talent to classify, significantly evaluate and prepare complex computing problems using fundamentals of computer knowledge and request domains.

PO3: Accomplish Investigations of Compound Computing Troubles: Ability to invent and ways experiments interpret data and present well up to date conclusions.

PO4: Current Implement Procedure: Skill to select recent computing tools, skills and techniques compulsory for original software solutions

PO5: Proficient Principles: Facility to apply and give expert principles and cyber systems in a universal monetary situation.

PO6: Modernization and Private Enterprise: Classify opportunities, private enterprise dream and use of original thoughts to build worth and means for the betterment of the human being and the world.

8. Programme Specific Outcomes (PSO)

PSO1: An ability to enhance the application of knowledge of theory subjects in diverse fields.

PSO2: Develop language proficiency to handle corporate communication demands.

PSO3: In order to enhance programming skills of the young IT professionals, the concept of project development in using the technologies learnt during the semester has been introduced.

PSO4: To enhance knowledge in robotics, provide experimental hardware equipment for teaching the basics of robotics, robot dynamics and control, and robot system design and application.

PSO5: To enhance logical ability and programming concepts by implementing programming lab.

PSO6: Ability to understand the changes or future trends in the field of computer application.

PSO7: Ability to identify, formulate, analyze and solve problems of programming using different languages.

9. Eligibility for admission to the course and examination

Candidates shall be admitted to the course provided he/she has passed plus two examinations of the State or Central Board with Computer Science/Mathematics/Physics/Chemistry/Biology as one of the subjects or any other Science subject that may be considered as equivalent by the M.S. University.

10. Duration of the Course

The students shall undergo the prescribed course of study for a period of not less than three academic years (Six semesters). Each semester contains 90 working days.

11. Medium of instruction and examination

The medium of instruction as well as examination will be in English.

12. Theory examination

The external evaluation will be based on the examination to be conducted by the university at the end of each semester.

13. Practical examination

Practical examinations will be conducted at the end of each semester.

14. Evaluation

- A. Each paper carries an internal component
- B. There is a pass minimum of 40% for external and overall components

Theory External: Internal Assessment = 75:25

Practical External: Internal Assessment = 50:50

C. Internal Assessment

Internal marks for Theory shall be allocated in the following manner:

The average of the best two tests from three compulsory tests	20 Marks
Assignment	05 Marks
Total	25 Marks

Note: Each test will be of one hour duration.

D. Practical

Internal marks for Practical shall be allotted in the following manner.

Experimental work	20 Marks
Record	10 Marks
Model Test	20 Marks
Total	50 Marks

E. Project Work

Components	Marks
Project Report	75 Marks
Viva -Voce	25 Marks
Total	100 Marks

Note:

- i) Students should carry out group project in major subject.
- ii) Project report will be evaluated by Central valuation and Viva-Voce will be conducted by both the External examiner and the Guide at the end of the 6th semester.

15. Grading System

The performance of the student is indicated by the Seven Points Scale Grading System as per the UGC norms given below

Grade	Grade point	Percentage of marks	Performance
O	9.5 and above	95-100	Outstanding
E	8.5 and above	85-94	Excellent
D	7.5 and above	75-84	Distinction
A	7 and above	70-74	Very Good
B	6 and above	60-69	Good
C	5 and above	50-59	Average
RA	0	Up to 49	Re-Appear

F. The overall performance level of the candidates will be assessed by the following formulae:

$$\text{Cumulative weighted average of marks} = \frac{\sum(\text{marks} + \text{credits})}{\sum \text{credits}}$$

$$\text{Cumulative weighted average grade points} = \frac{\sum(\text{Grade points} \times \text{credits})}{\sum \text{credits}}$$

16. The question paper pattern for all theory papers shall be as follows.

Duration of Exam: 3Hours

Section	Type of questions	Mark
Part-A	Multiple choice question (Two question from each unit compulsory)	1×10=10 Marks
Part-B	Internal Choice questions (One question from each unit: either/or)	5×5=25 marks
Part-C	Internal Choice questions (One question from each unit: either/or)	8×5=40 marks
	Total	75 Marks

17. The question paper pattern for all practical papers shall be as follows.

Duration of Practical Exam: 3 hours

1	Major Experiment	25
2	Minor Experiment	15
3	Spotters	05
4	Record	05
	Total	50 Marks

B.C.A
[Bachelor of Computer Applications]

(Choice Based Credit System)

(with effect from the academic year 2021-22 onwards)

Se m. (1)	Pt. I/II/ III/ IV/V (2)	Sub No. (3)	Course Status (4)	Course Title (5)	Con- tact Hrs/ Week (6)	L Hrs./ Week (7)	T Hrs./ Week (8)	P Hrs./ Week (9)	C Cre (10)
I	I	1	Language	Tamil / Other Language	6	6	0	0	4
	II	2	Language	Communicative English-I	6	6	0	0	4
	III	3	Core-I	Programming in C	4	4	0	0	4
	III	4	Major Practical - I	C Programming Lab	4	0	0	4	2
	III	5	Add on Major (Mandatory)	Professional English for Physical Sciences - I	4				4
	III	6	Allied - I	Digital Design	4	4	0	0	3
	IV	7	Common	Environmental Studies	2	2	0	0	2
Subtotal					30				22
II	I	8	Language	Tamil/Other Language	6	6	0	0	4
	II	9	Language	Communicative English-II	6	6	0	0	4
	III	10	Core-II	Object Oriented Programming with C++	4	5	0	0	4
	III	11	Major Practical - II	Object Oriented Programming with C++ Lab	4	0	0	4	2
	III	12	Add on Major (Mandatory)	Professional English for Physical Sciences - II	4				4
	III	13	Allied - II	Mathematical Foundation for Computer Science	4	3	0	0	3
	IV	14	Common	Value Based Education / சமூக ஒழுக்கங்களும் பண்பாட்டு வழியங்களும் / Social Harmony	2	2	0	0	2
Subtotal					30				22

L-Lecture

T-Tutorial

P- Practical

Distribution of marks between External and Internal Assessment is

For Theory 75 : 25

For Practical 50 : 50

Programming in C

Course Objective:

- Aims to provide exposure to basic concepts of C programming.
- It familiarizes basic syntax, compilation and execution of C programming.
- It explores Arrays, Functions, structures and file concepts.
- It also provides design, code test and debug in C programming.

Course outcome:

- To understand basic understanding of computers and programming syntax.
- To explore basic understanding of computers and programming syntax.
- To implement standard libraries, operators, functions and arrays.
- To create C programming with features like pointers and structures.
- To implement various file handling techniques.

Unit I

(12 Hours)

Overview of C:

Introduction- Importance of C - Sample C Programs - Basic structure of C - Executing C program

Constant, variables and data types:

Introduction- Character set - tokens – keywords and identifiers – constants – variables- data types – declaration of variables – assigning values of variables.

Operators and expressions:

Introduction – arithmetic of operations- relational operator – assignment operator – increment and decrement operator – conditional operator – bitwise operator – special operator – evaluation of expressions – precedence of arithmetic operators – type conversion in expression- operator precedence and associatively- mathematical functions

Unit II

(12 Hours)

Managing input and output operators:

Introduction: Reading a character- writing a character – formatted input – formatted output

Decision making and branching:

Introduction – decision making with IF statement- simple IF statement – The IF ELSE statement- nesting of IF – ELSE statement –ELSE IF ladders- The switch statement – The ?: operators – The GOTO statement

Decision making and looping:

The **while** statement – The **do** statement – The **for** statement- Jump in loops

Unit III**(12 Hours)****Arrays:**

One dimensional arrays –Two dimensional arrays -Initializing two dimensional arrays – multi dimensional arrays

Handling of character strings:

Introduction: declaring and Initializing string variables- Reading string from terminal- writing string to screen – arithmetic operation on characters – putting strings together – comparison of two strings together – string handling functions

Unit IV**(12 Hours)****User defined functions:**

Introduction – need for user- define functions- A multi- function program – The form of C functions- return values and their types – calling a function- category of function – no argument and no return values – argument with no return values -argument with return values – handling of non integer functions – nesting of functions – recursion – function with arrays – the scope and life time of variables in functions.

Unit V Pointers**(12 Hours)**

Introduction: understanding pointers – accessing the address of variables – declaring and initializing pointers – accessing a variable through its pointer – pointer expressions – pointer increments and scale factor – pointers and character strings – pointers and functions – points on pointer.

TOTAL: 60 HOURS**Mapping of COs to POs and PSOs**

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO3	H	PSO1	H	K1
CO2	PO3, PO6	H/M	PSO2, PSO6	H/M	K2
CO3	PO1, PO2, PO5	H/M/M	PSO4	M	K3
CO4	PO1, PO5	H/M	PSO4	H	K4
CO5	PO3, PO4	H/M	PSO4, PSO5	H/M	K5

(L – Low, M – Medium, H – High; K1 – Understand, K2 – Apply, K3 – Analyze, K4 – Evaluate, K5 Create)

Text Book:

Programming in ANSI C – E.Balagurusamy, Tata McGraw-Hill Publishing Company, 2008.

Reference Book:

Programming with ANSI and Turbo C – Ashok N. Kamthane, Pearson Education, 2008.

C Programming Lab

Practical List

1. Find the area of a Triangle
2. To Solve the possible roots of the Quadratic Equation
3. To arrange a List of numbers in Descending Order
4. To Find Ncr Value using Functions
5. To check a given String is Palindrome or not
6. To find Transpose of a Matrix
7. To Multiply two matrices
8. To Prepare Marklist for students
9. To Sort a List of names in Alphabetical Order

DIGITAL DESIGN

Course Objective:

- To familiarize the student with basic principles and fundamentals in digital logics and design.
- To develop basic skills using tools and theory used in design process.
- To understand the creative process, develop techniques and methods of creative problem solving.

Course outcome:

Upon completion of the course, the students will be able to

- Definition of digital logics and Circuits(K1)
- Understand about the digital devices (K2)
- Understand about digital arithmetic circuits(K2)
- Acquire Knowledge on basics of Gates and its Applications(K4)
- Have the necessary understanding on Registers for Counting Applications (K4)

Unit I : (15 Hours)

Digital System and binary numbers:

Digital systems – binary numbers – number base conversion – Octal and hexa decimal numbers – complements – signed binary numbers – binary codes – binary storage and registers – binary logic.

Boolean algebra:

Introduction – basic definition – axiomatic definition of Boolean algebra – basic theorem and properties and of Boolean algebra – Boolean functions.

Unit II : (15 Hours)

Logic gates:

Canonical and standard forms – other logic operations – digital logic gates and integrated circuits.

Gate-Level minimization:

Introduction : The Map method – Four- variable Maps –Five-variable Map – Product –of-sums simplifications- Don't conditions.

Unit III : (15 Hours)

NAND and NOR implementation- other two level implementations – Exclusive OR Functions.

Combinational Logic: Introduction – Combinational circuits – Analysis Procedure - Design Procedure – Binary Adder – Subtractor – Decimal Adder - Binary Multiplier - Magnitude Comparator.

Unit IV : (15 Hours)

Combinational Logic: Decoders - Encoders – Multiplexers.

Synchronous Sequential Logic:

Introduction –Sequential Circuits – Storage Element Latches - Storage Element Flip- Flops - Analysis of Clocked Sequential Circuits.

Unit V :**(15 Hours)****Registers and Counters:** Registers – Shift Registers – Ripple Counters – Synchronous Counters – Other Counters.**Memory :** Introduction – Random access memory – Memory Decoding – Error Detection and Correction – Read Only Memory.**TOTAL: 45 HOURS****Mapping of COs to POs and PSOs**

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/M/H	Cognitive Level K1 to K6
CO1	PO3	H	PSO1	H	K1
CO2	PO3, PO6	H/M	PSO2, PSO6	H/M	K2
CO3	PO1, PO2, PO5	H/M/M	PSO4	M	K3
CO4	PO1, PO5	H/M	PSO4, PSO5	H/M	K4
CO5	PO3, PO4	H/M	PSO4	H	K5

(L – Low, M – Medium, H – High; K1 – Understand, K2 – Apply, K3 – Analyze, K4 – Evaluate, K5 Create)

Text Book:

Digital Design - Fourth Edition – M.Morris Mano, Michael D Ciletti,- Prentice Hall of India Pvt Ltd., 2007.

Reference Books:

1. Digital Principles and Applications – Albert Paul Malvino, Donald P Leach, Tata McGraw-Hill Publishing Company Ltd.

2. Digital Principles and Design – Donald D.Givone, Tata McGraw-Hill Publishing Company Limited

OBJECT ORIENTED PROGRAMMING WITH C++**Course Code:** -----

L	T	P	C
5	0	0	4

Course Objectives:

- Impart knowledge of object oriented programming concepts and implement them in C++
- Enable to differentiate procedure oriented and object-oriented concepts.
- Equip with the knowledge of concept of Inheritance so that learner understands the need of inheritance.
- Explain the importance of data hiding in object oriented programming

Course Outcomes:

- Define complete overview of Data types, functions, control statements and pointers.
- Apply Object Oriented Programming Concepts.
- Demonstrate the use of virtual functions to implement polymorphism.
- Demonstrate Function Overloading and Operator Overloading concepts
- Illustrate Templates, Files and Exception Handling.

UNIT I**(12 Hours)**

Principles of Object-oriented Programming: Software Evolution – A look at Procedure-Oriented Programming – Object-Oriented Programming Paradigm – Basic concepts of object-Oriented Programming – Benefits of OOP – Object-Oriented Languages- Applications of OOP

Beginning with C++ :What is C++? – Applications of C++ - A simple C++ Program – More C++ statements – An example with Class- Structure of C++ Program – Reference Variables – Operators in C++ - Scope Resolution Operator – Member De referencing Operators – Memory Management Operators – Manipulators – Type Cast Operators

UNIT II**(12 Hours)**

Functions in C++: Introduction – The Main Function – Function prototyping – Call by Reference – Return by reference – Inline Functions - Default Arguments – const Arguments – Function Overloading – Math Library Functions

Classes and Objects: Introduction - C Structure Revisited – Specifying a Class – Defining Member Function- A C++ Program with Class -Making an outside Function Inline –Nesting of Member Function – Private member functions- Arrays with in a class – Memory allocation for objects – Static Data Members – Static Member Functions, Arrays of objects – Objects as Function arguments – Friendly Functions – Returning Objects - Pointers to Members – Local Classes

UNIT III**(12 Hours)**

Constructors and Destructors : Introduction – Constructors – Parameterized constructors – multiple constructors in a class – Constructors with Default arguments – Dynamic Initialization of Objects- Copy Constructors – Dynamic Constructors – Constructing two dimensional Arrays –Destructors **Operator Overloading and Type Conversion:**

Introduction – Defining Operator Overloading – Overloading unary operators – Overloading Binary Operators – Overloading binary operators using Friends – Manipulation of strings using operators – Rules for overloading operators – Type conversions

UNIT IV**(12 Hours)**

Inheritance :Extending Classes : Introduction – Defining Derived Classes – Single inheritance – Making a Private Member Inheritable – Multilevel Inheritance – Multiple Inheritance – Hierarchical Inheritance – Hybrid Inheritance – Virtual Base Classes -Abstract Classes – Constructors in Derived Classes – Member Classes –Nesting of Classes

Unit V**(12 Hours)**

Managing Console I/O Operations: Introduction - C++ Streams – C++ Stream Classes – Unformatted I/O Operations – Formatted Console I/O Operation – Managing output with Manipulators.

Working with Files: Introduction – Classes for File Stream Operators – Opening and closing a File – Detecting end-of-file _ File Pointers and their Manipulators – Sequential Input and Output Operations – Error Handling during File Operations – Command –Line Arguments.

(Total: 60 Hours)**Mapping of COs to POs and PSOs**

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO1	M	PSO1, PSO5	M/M	K1
CO2	PO2, PO4	H/M	PSO2, PSO3	H/M	K2
CO3	PO3	H	PSO4,PSO6	H/M	K5
CO4	PO5,PO6	M/H	PSO5	M	K6
CO5	PO7	H	PSO4,PSO7	H/H	K4

(L – Low, M – Medium, H – High; K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5–Evaluate, K6 – Create)

Text Book:

Object Oriented Programming C++ -Third Edition – E Balagurusamy, Tata McGraw-Hill Publishing Company Limited, 2008.

Reference Book:

1. Complete Reference C++ - Herbert Schildt, Fourth Edition, Tata McGraw-Hill Publishing Company Limited, 2003.
2. Object Oriented Programming with ANSI and Turbo C++ - Ashok N. Kamthane, Pearson Education, 2003.
3. C++ How to Program – Deitel, Fifth Edition Prentice Hall of India, 2004.
4. Programming with C++ - D.Ravichandran, Second Edition , Tata McGraw-Hill Publishing Company Limited,2003.

OBJECT ORIENTED PROGRAMMING WITH C++ LAB

Course Code: -----

L	T	P	C
4	0	0	2

List of Practical

1. Finding the Volume of any three geometric figures using Function Overloading
2. Exchange values between two class objects using Friend functions
3. Define a class to represent a Bank Account

Data Members:

- 1.Name of the Depositor
2. Account Name
- 3.Type of Account
4. Balance amount in the Bank

Member Functions

- 1.To Assign initial values
- 2.To withdraw amount
3. To Deposit an amount
- 4 .To display name and balance

Write a main Program to test the program

4. Find the minimum of two objects using friend function
5. Using Dynamic Constructors , concatenate two strings
6. Overload unary minus operator to change the sign of given vectors (3elements)
7. Overload Binary + Operator to add two complex numbers
8. Add two vector objects . Use >> and << overloading
9. Process student Mark List using multilevel inheritance
10. Using Hierarchical Inheritance, process employee details

**MATHEMATICAL FOUNDATION FOR COMPUTER
SCIENCE**

L	T	P	C
3	0	0	3

Course Code: -----

Course Objectives:

- To introduce the concepts of mathematical logic
- To introduce the concepts of sets, relations, and functions.
- To perform the operations associated with sets, functions, and relations.
- To relate practical examples to the appropriate set, function, or relation model, and interpret the associated operations and terminology in context.
- To introduce generating functions and recurrence relations.
- To use Graph Theory for solving problems.

Course Outcomes:

- Ability to apply mathematical logic to solve problems.
- Understand sets, relations, functions, and discrete structures.
- Able to use logical notation to define and reason about fundamental mathematical concepts such as sets, relations, and functions.
- Able to model and solve real-world problems using graphs and trees.

UNIT I

(15 Hours)

Set Theory : Basic Concepts of Set Theory - Inclusion and Equality of Sets – Power Set – Operations on Sets – Cartesian Products – Relations – Equivalence Relations

UNIT II

(15 Hours)

Functions: Definition – Examples – One and Onto Functions – Bijective Functions – Identify Functions - Composition of Functions – Inverse Functions

Unit III

(15 Hours)

Mathematical Logic : Statements and Notation – Connectives – Negation, Conjunction, Disjunction – Statement Formulas and Truth Tables – Conditional and Bi conditional – well formed Formulas – Tautology – Equivalence of Formulas – Duality Law – Principle Disjunctive Normal Forms – Principal conjunctive Normal Forms

Unit IV

(15 Hours)

Graph: Definition – Examples – Sub graphs – Finite and Infinite Graph – Degree of a Vertex – Isolated and Pendent Vertices – Types of Graphs –Examples

Unit V

(15 Hours)

Paths and Circuits: Walk, Path and Circuits – Connected and Disconnected Graphs – Euler Graphs – Operations on Graphs – Trees – Properties of Trees – Rooted and Binary Trees.

(Total: 45 Hours)

Mapping of COs to POs and PSOs

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO1	M	PS01, PSO3	M/H	K1
CO2	PO3	H/M	PS02, PSO5	H/H	K3
CO3	PO2,PO4	M/H	PSO5,PSO6	H/M	K6
CO4	PO5	H	PSO4	M	K4

(L – Low, M – Medium, H – High; K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5–Evaluate, K6 – Create)

Text Book:

Mathematical Foundations for Computer Science – Part I - D Glory Ratna Mary, Y.S.Irine Viola, Veda Publications

Reference Books:

1. Modern Algebra – Arumugam and Isaac, SciTech Publications.
2. Graph Theory - Arumugam and Isaac, SciTech Publications.
3. Discrete Mathematics for Computer Science – Hary Haggard, John Schlipf and SueWhitesides, Thomson Publications.

MANONMANIAM SUNDARANER UNIVERSITY
B.C.A
(CHOICE BASED CREDIT SYSTEM)
(WITH EFFECT FROM THE ACADEMIC YEAR 2021-2022)

Se m	PartI /II/II I/IV/ v/vI	Sub · No.	Subject Status	Subject Title	Contact Hrs/ week	L Hrs/ Week	T Hrs/ Week	P Hrs/ Week	Credits
III	I	14	Language	Tamil	6	6	0	0	4
	II	15	Language	English	6	6	0	0	4
	III	16	Core	Java Programming	4	4	0	0	4
	III	17	Core	Financial Accounting	3	3	0	0	4
	III	18	Major Practical III	Java Programming Lab	2	0	0	2	2
	III	19	Allied - III	Data Structure	2	2	0	0	3
	III	20	Allied Practical III	Data Structure LAB	2	0	0	2	2
	III	21	Skill based Core Theory I	Programming with PHP and MySQL	3	3	0	0	4
	IV	22	Non Major Elective	Introduction to IT/Introduction to Computers	2	2	0	0	2
	IV	23	Common	Yoga(* Excluding Contact Hours & Credit)	2*	2	0	0	2*
Sub Total					30				29

JAVA PROGRAMMING

L T P C
4 0 0 4

COURSE OBJECTIVES:

- ✓ To learn Object Oriented Programming language.
- ✓ To learn about Networking and event handling concepts.
- ✓ To handle abnormal termination of a program using exception handling.
- ✓ To design user Interface using AWT.

COURSE OUTCOMES:

Upon completion of the course, the students should be able:

CO1: To get knowledge of the structure and model of the Java programming language.

CO2: To understand how to design applications with threads in Java.

CO3: To get Knowledge for developing software in the Java programming language.

CO4: To learn how to use exception handling in Java applications.

CO5: To use the Java programming language for various programming technologies.

COURSE OUTLINE:

UNIT – 1 HISTORY, DATA TYPES AND OPERATORS

History & Evolution of Java: Creation of Java – The java Buzz words – An overview of Java Object Oriented Programming. **Data types:** A closer Look at Literals – Variables – Type conversion and casting – Automatic type promotion in Expressions. **Arrays:** One Dimensional Array – Multi Dimensional Arrays. **Operators:** Arithmetic Operators – Bitwise operators – Relational operators – Boolean Logical operators – Assignment operators – Conditional operators–Operator Precedence—Control statements. **(12 L)**

UNIT - 2 CLASSES, METHODS AND INHERITANCE AND ABSTRACT CLASS

Class Fundamentals – Declaring objects – Assigning object Reference variables – Introducing Methods – Constructors – This Keyword - Garbage collection. **A Closer Look at Methods and Classes:** Overloading Methods – Overloading Constructors –Using object as parameters – Returning objects – Recursion – Introducing Access control – understanding static – Introducing final – Nested and Inner classes – String class –String Buffer Class – Using command line arguments. **Inheritance:** Basics – Using super – creating Multilevel Hierarchy – Method overriding – Dynamic Method Dispatch – Using Abstract class – Using final with inheritance.**(12 L)**

UNIT - 3 PACKAGES, INTERFACES, EXCEPTION HANDLING AND MULTITHREADING

Packages –Access Protection -Importing packages – Interfaces. **Exception Handling:** Fundamentals – Exception Types – Uncaught Exceptions – Using try and catch – Multiple catch clauses – Nested try statements – throw- throws- finally – Java’s Built – in Exception – creating your own Exception subclasses. **Multithreaded Programming:** Java Thread Model – Main Thread – Creating a Thread - Creating Multiple Threads–Using is Alive () and join () – Thread priorities – Synchronization – Interthread Communication – Suspending Resuming: and stopping Threads. **(12 L)**

UNIT – 4 NETWORKING, APPLETS AND EVENT HANDLING

Networking Basics – Networking Classes and Interfaces – Inet Address – Inet4 Address and Inet6 Address – TCP/IP client Sockets – URL – URL Connection – HTTP URL Connection – Cookies. **The Applet Class:** An Applet skeleton – Simple Applet Display Methods – Example programs. **Event Handling:** Two Event handling Mechanisms – Delegation Event Model – Event classes – Sources of Events – Event Listener Interfaces Handling Mouse events – Handling Keyboard events. **(12 L)**

UNIT - 5 AWT AND AWT CONTROLS

AWT Classes – Window fundamentals – working with Frame Windows - working with Graphic and color. **Using AWT controls:** Controls fundamentals – Labels – using Buttons – Applying check Boxes – Check Box group – Choice controls – Using a Text field – Using a Text Area – Understanding Layout Managers (Flow Layout only) – Menu Bars and Menus. **(12 L)**

Mapping of COs to POs and PSOs

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO3	H	PSO1	H	K1
CO2	PO3, PO6	H/M	PSO2, PSO6	H/M	K2
CO3	PO1, PO2, PO5	H/M/M	PSO4	M	K3
CO4	PO1, PO5	H/M	PSO4	H	K4
CO5	PO3, PO4	H/M	PSO4, PSO5	H/M	K5

(L – Low, M – Medium, H – High; K1 – Understand, K2 – Apply, K3 – Analyze, K4 – Evaluate, K5 Create)

TEXT BOOK:

JAVA - The Complete Reference -Herbert Schildt, Eleventh Edition, Oracle Press, 2019.

REFERENCE BOOKS:

1. Core and Advanced Java Programming – Black Book, Dreamtech Press, 2018
2. Programming with Java - A Primer, E. Balaguruswamy, Sixth Edition, 2016.

CORE SUBJECT – II **FINANCIAL ACCOUNTING**

L T P C
3 0 0 4

COURSE OBJECTIVES:

- ✓ To impart basic accounting knowledge.
- ✓ To provide knowledge on the fundamental of financial accounting.
- ✓ To expose the student to various financial transaction and its current applications.

COURSE OUTLINE:

UNIT -1 BASIC CONCEPTS OF ACCOUNTING

Introduction to Accounting : Need for Accounting –Accounting as the language of business – Attributes and steps of Accounting –Book keeping Vs Accounting – Branches of Accounting – Methods of Accounting – Types of Accounting – Accounting Rules - Bases of Accounting – Accounting terminology. Basic Accounting Concepts: Meaning and classification of Accounting- Accounting Concepts – Accounting Conversion – Accounting equations. **(10 L)**

UNIT – 2 JOURNAL AND LEDGER

Recording a Financial Data: Memorandum Book, business transaction, Journal, Rules for Debit and Credit, Compound Journal entry, Advantages of Journal, Ledger, Ledger Account, Ledger Posting, Process of Posting, Balancing of An Account, Significance of Balances, Relation between Journal and Ledger-Subsidiary Books. **(15 L)**

UNIT – 3 PREPARING TRIAL BALANCE

Trial Balance: Objects, Methods of Preparing Trial balance, how to locate errors, hints for the preparation of trial balance & problems. **(11 L)**

UNIT -4 FINAL ACCOUNTS

Trading account – individual items posted to the debit of trading account – individual items credited to trading account – advantages of trading account – profit & loss account - advantages of profit & loss account- manufacturing account- balance sheet- classification of assets & liabilities. **(12 L)**

UNIT – 5 ACCOUNTS FOR NON PROFIT ORGANISATION

Introduction – Final accounts of no trading concern- receipts and payments account – features- income & expenditure account – feature- distinction between the two – treatment of special items – some important adjustments – types of problems – Distinction between income and expenditure account and profit and loss account – accounts of professional men. **(12 L)**

COURSE OUTCOMES:

Upon completion of the course, the students should be able:

- To acquire knowledge about general aspects of business operations.
- To explain the concepts and procedures of financial reporting, including income and expenditure statement, balance sheet etc.
- To locate and analyze financial data from annual reports of corporations.

TEXT BOOKS:

1. Financial Accounting - T.S.Reddy, A.Murthy – Margham Publications, 2012.
2. Fundamentals of Advanced Accounting - R.S.N.Pillai, Bagavathi, S.Uma, 5th Edition, S.Chand Publication, 2012.

REFERENCE BOOKS:

1. Essentials of Financial Accounting – Asish K.Bhattacharayya, PHI, 2020
2. Advanced Accountancy - S.P.Jain and Narang – Kalyani Publications, 2017.

DATA STRUCTURES

L T P C
2 0 0 3

COURSE OBJECTIVES:

- ✓ To understand different methods of organizing large amounts of data.
- ✓ To efficiently implement different data structure.
- ✓ To efficiently implement solution for different problems.

COURSE OUTCOMES:

Upon completion of the course, the students should be able:

- CO1: An understanding of the basic data structures.
 CO2: To describe Data structures like stack, queue, tree and graph.
 CO3: An understanding of the basic search and sort algorithms.
 CO4: The appropriate use of a particular data structure and algorithm to solve a problem.

COURSE OUTLINE:

UNIT – 1 DATATYPES INTRODUCTION

Introduction: Pseudo code – The Abstract Data Type – A Model for an Abstract Data Type – Algorithms Efficiency.

Searching: List Searches – Hashed List Searches – Collision Resolution. (10 L)

UNIT – 2 LINKED LISTS

Linear List: Linked List Concepts – Linked List Algorithms – Processing a Linked List – Complex Linked List Structures. (10 L)

UNIT – 3 STACKS AND QUEUES

Basic Stacks Operations – Stack Linked List Implementation – Stack Applications – Queue operations – Queue Linked List Design. (10 L)

UNIT – 4 TREES

Basic Tree Concepts – Binary Tree - Binary Tree Traversals – Expression Trees- General Trees – Binary Search Trees – Heap definition – Heap Structure – Basic Heap Algorithm. (8 L)

UNIT - 5 INTRODUCTION TO GRAPHS

Sorting And Graphs: General Sort Concepts – Quick sort – External sorts. Graphs: Terminology – Operations–Graph storage Structure–Networks. (7 L)

Mapping of COs to POs and PSOs

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO3	H	PSO1	H	K1
CO2	PO3, PO6	H/M	PSO2, PSO6	H/M	K2
CO3	PO1, PO2, PO4	H/M/M	PSO4	M	K3
CO4	PO1, PO5	H/M	PSO4, PSO5	H/M	K5

(L – Low, M – Medium, H – High; K1 – Understand, K2 – Apply, K3 – Analyze, K4 – Evaluate, K5 Create)

TEXT BOOK:

1.Data Structures a Pseudo Code Approach with C++, Richard F. Gilberg & Behrouz A Forouzan, Brooks/Cole (Thomson Learning) 2001. Chapters: 1,2.1,2.3,2.4,3.1-3.4,3.6,4.1-4.3,5.1,5.2,7.1-7.5,8.1,9.1-

9.5,11.1,11.4 (Quick Sort only) 11.6, 12.1-12.5.

REFERENCE BOOKS:

1. Fundamentals of Data Structures - Eilis Horowitz & Sartaj, Galgotia Publications 2008
2. Data Structures - Seymour Lipschutz, Tata McGrawHill, 2014

**SKILL BASED CORE THEORY – I
PROGRAMMING WITH PHP & MYSQL**

**L T P C
3 0 0 4**

COURSE OBJECTIVES:

- ✓ To understand the concepts of open sources.
- ✓ To learn and use open-source database management system MySQL
- ✓ To create dynamic web pages and websites.
- ✓ To connect webpages with database.

COURSE OUTCOMES:

Upon completion of the course, the students should be able:

- CO1: To observe and understand the role, structure, control flow, classes and concepts in PHP and tables in MySQL
CO2: To implement the concepts in PHP and queries in MySQL.
CO3: To analyze functions for data and file handling in PHP and data management in MySQL
CO4: To evaluate the programming concepts in PHP to develop interfaces and manipulate data using MySQL.
CO5: To create applications using PHP and MySQL.

COURSE OUTLINE:

UNIT-1

Introduction: Introduction- Open-source PHP – PHP history- features-variables- statements operators’ conditional statements-if-switch-nesting conditions-merging forms with conditional statements-loops-while-do-for – loop iteration with break and continue. **(12 L)**

UNIT – 2

Arrays and Functions: Arrays: Creating an array- modifying array-processing array-grouping form with arrays-using array functions- creating user defined functions- using files- sessions cookies- executing external programs – Creating sample applications using PHP. **(12 L)**

UNIT – 3

File Handling Opening files using fopen - looping over a files content with feof- reading text from a file using fgets - closing a file- reading character with fgetc- reading whole file with file_get_contents reading a file into an array with file-checking if a file exists- fscan fparse_ini_file- Getting file information with stat-fseek- copying files with copy- deleting files writing to a file-reading and writing binary files – locking files. **(12 L)**

UNIT - 4 MySQL:

Effectiveness of MySQL -MySQL Tools-Prerequisites for MySQL connection Databases and tables- MySQL data types-Creating and manipulating tables-Insertion- updation and deletion of rows in tables -Retrieving data- Sorting and filtering retrieved data -Advanced data filtering Data manipulation functions-Aggregate functions -Grouping Data-Subqueries Joining Tables- Set Operators-Full text searching. (12 L)

UNIT- 5 PHP with MySQL:

Working MySQL with PHP-database connectivity- usage of MYSQL commands in PHP processing result sets of queries- handling errors-debugging and diagnostic functions validating user input through Database layer and Application layer formatting query output with Character- Numeric- Date and time – sample database applications. (12 L)

Mapping of COs to POs and PSOs :

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO3	H	PSO1	H	K1
CO2	PO3, PO6	H/M	PSO2, PSO6	H/M	K2
CO3	PO1, PO2, PO5	H/M/M	PSO4	M	K3
CO4	PO1, PO5	H/M	PSO4	H	K4
CO5	PO3, PO4	H/M	PSO4, PSO5	H/M	K5

(L – Low, M – Medium, H – High; K1 – Understand, K2 – Apply, K3 – Analyze, K4 – Evaluate, K5 Create)

TEXT BOOKS

1. Vikram Vaswani, “PHP and MySQL”- Tata McGraw-Hill- 2005.
2. Ben Forta, “MySQL Crash course”, SAMS- 2006.
3. Steven Holzner ,“The Complete Reference PHP”, Tata McGraw Hill,2008

REFERENCE BOOKS:

1. Tim Converse, Joyce Park and Clark Morgan, “PHP 5 and MySQL”,Wiley India reprint, 2008.
2. Robert Sheldon, Geoff Moes, “Beginning MySQL”,Wrox, 2005.

**NON-MAJOR ELECTIVE PAPER
[CHOOSE ANY ONE]
INTRODUCTION TO INFORMATION TECHNOLOGY /
INTRODUCTION TO COMPUTERS**

**L T P C
2 0 0 2**

INTRODUCTION TO INFORMATION TECHNOLOGY

COURSE OBJECTIVES:

- ✓ To understand the principles of digital devices, computer hardware, software, telecommunications, networking and multimedia.
- ✓ This course provides a sound foundation on the basic theoretical and practical principles behind the technologies.
- ✓ To discuss up to date issues surrounding them including social aspects and how they impact everyday life.

COURSE OUTCOMES:

Upon completion of the course, the students should be able:

CO1: To understand the architecture of the computer.

CO2: To know about internet & its applications.

CO3: To understand and define about the current trends in IT.

COURSE OUTLINE:

UNIT - 1 INFORMATION TECHNOLOGY BASICS

Introduction, Information, Technology, Information Technology, Present Scenario, Role of Information Technology, Information Technology and internet, Careers in IT Industry. Computer Organization and Architecture: Central Processing Unit, inside a computer, Data representation in Computer, Coding Schemes. **(6 L)**

UNIT – 2 COMPUTER STORAGE AND MEMORY

Introduction, Memory Hierarchy, Random Access Memory (RAM), Read Only Memory (ROM), RAM, ROM and CPU interaction, Types of Secondary storage devices, Magnetic tape, Magnetic disk, types of magnetic disk, optical disk, type of optional disks.

(6 L)

UNIT – 3 INPUT & OUTPUT DEVICES

Input, Output Media: Introduction, types of input devices, types of output devices, **Multimedia Essentials:** Introduction, Multimedia definition, Building blocks of Multimedia, Multimedia system, Multimedia applications, Virtual reality.

(6 L)

UNIT – 4 ABOUT INTERNET

The Internet: Introduction, Evolution of Internet – Basic Internet terms – Getting Connected to Internet – Internet Applications – Data over Internet. **Internet tools:** Introduction – Web Browser – Browsing

Internet using Internet Explorer – E-Mail – Search engines – Instant messaging.
(6 L)

UNIT V CURRENT TRENDS IN IT

Emerging trends in IT: Introduction, E-Commerce – Electronic Data Interchange – Mobile Communication – Bluetooth – Global Positioning System – Infrared Communication – Smart Card – Imminent Technologies. (6 L)

Mapping of COs to POs and PSOs :

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO3	H	PSO1	H	K1
CO2	PO3, PO6	H/M	PSO2	H	K2
CO3	PO1, PO2, PO5	H/M/M	PSO4, PSO6	H /M	K4

(L – Low, M – Medium, H – High; K1 – Understand, K2 – Apply, K3 – Analyze, K4 – Evaluate, K5 Create)

TEXT BOOK:

- Introduction to Computer and Information Technology - D.GloryRatha Mary, S.Selvanayahi, Shekina Publications.

REFERENCE BOOKS:

- A book of Fundamentals of Information Technology - Anshuman Sharma, Vishal Sharma, Hardeep Singh & S.K.Kakkar, 5th Edition, Panjab University, 2020
- Fundamentals of Information Technology - Anoop Mathew, S.Kavitha Murugesan, Narosa , 2013
- Introduction to Information Technology - V.Rajaraman, PHI, 2018.

INTRODUCTION TO COMPUTERS

L T P C
2 0 0 2

COURSE OBJECTIVES:

- ✓ To learn about basic components of the computer.
- ✓ To study functions and types of operating system.
- ✓ To study about software Installation.

COURSE OUTCOMES:

Upon completion of the course, the students should be able:

CO1: To understand the meaning and basic components of a computer system.

CO2: To define and distinguish Hardware and Software components of computer system.

CO3: To understand the memory and storage devices and types of Operating system.

COURSE OUTLINE:

UNIT – 1 COMPUTER BASICS

Introduction, Characteristics of Computers – Evolution of Computers, Generation of Computers, Classification of Computers, the Computer System, Application of Computers.

(6 L)

UNIT – 2 COMPUTER ORGANIZATION AND ARCHITECTURE

Central Processing Unit, Inside a computer, Data representation in Computer, Coding Schemes.

(6 L)

UNIT - 3 INPUT & OUTPUT UNITS

Computer input units, Computer output units.

(6 L)

UNIT – 4 MEMORY & STORAGE DEVICES

Computer Memory and Storage: Introduction, Memory Hierarchy, Random Access Memory (RAM), Read Only Memory (ROM), RAM, ROM and CPU interaction, Types of Secondary storage devices, Magnetic tape, Magnetic disk, types of magnetic disk, optical disk, type of optional disks.

(6 L)

UNIT – 5 OPERATING SYSTEM

Introduction, Operating System, Definition, Evolution of Operating System, Types of Operating System, Functions of Operating System. Computer Software: Introduction, Computer Software, Definition, Categories of Software, Installing and Uninstalling software, Software piracy, Software terminologies.

(6 L)

Mapping of COs to POs and PSOs :

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO3	H	PSO1	H	K1
CO2	PO3, PO6	H/M	PSO2, PSO6	H/M	K2
CO3	PO1, PO2, PO5	H/M/M	PSO4, PSO5	M/H	K4

(L – Low, M – Medium, H – High; K1 – Understand, K2 – Apply, K3 – Analyze, K4 – Evaluate, K5 Create)

TEXT BOOK:

- Introduction to Computer and Information Technology - D.GloryRatha Mary, S.Selvanayahi, Shekina Publications.

REFERENCE BOOKS:

- Introduction to Computer - Peter Norton, Tata McGraw Hill, 2002
- Fundamental of Information Technology - Alex Leon& Mathews Leon Vikas Publication – New Delhi, 2009

MAJOR PRACTICAL – III JAVA PROGRAMMING LAB

**L T P C
0 0 2 2**

PRACTICAL LIST

1. Design a class called student with data members name, Roll Number and three subject marks. include methods to assign initial values, find total and average and to display total and average marks .
2. Write a java program to find the area of Square, Rectangle, and Triangle by (a) Overloading Constructor Method (b) Overloading Method
3. Write a java program using Multilevel Inheritance.
4. Write a java program using Overriding Methods
5. Write a java program to create and Implement an Interface.
6. Write a java program to Create and Import Package (Minimum Three Classes)
7. Write a java program to throw the following Exception: (a)Negative Array Size (b) Array Index out of Bounds
8. Write a java program to Create your Own Exception
9. Write a java program to create a thread Using Thread Class.
10. Write a java program Display a Simple Banner Applet.
11. Write a java program using Applet to Design a Web Page
12. Write a java program to illustrate Mouse and keyboard Event Handling.
13. Write a java program to Design a calculator to perform arithmetic operations.

14. Write a java program, which creates a window with a checkbox group with boxes for the colors, violet, indigo, yellow, orange, red, blue and green. When the button is selected the background color must change accordingly.
15. Write a java program to create a File menu with New, Save and Close options, Edit menu with cut, copy, and paste options.

ALLIED PRACTICAL LAB – III
DATA STRUCTURES LAB

L T P C
0 0 4 2

PRACTICAL LAB

1. Write a C++ program to implement sequential search and Binary search in array.
2. Write a C++ program to implement linked list and perform the following operations
 - (a) Add a node as first node.
 - (b) Add a node as last node.
3. Write a C++ program to implement linked list and implement the following Objects.
 - (a) Delete the first node.
 - (b) Delete the last node.
4. Write a C++ program to implement a stack linear list perform the push and pop Operations.
5. Write a C++ program to implement binary tree using Linked and Perform the following traversal:
 - (a) Inorder traversal. (b) Preorder traversal. (c) Postorder traversal.
6. Write a C++ program to implement merge sort.
7. Write a C++ program to implement quick sort.