

JAMAL MOHAMED COLLEGE (AUTONOMOUS) : TIRUCHIRAPPALLI-620 020

B.C.A. [From 2008-2009 onwards]

SYLLABI & SCHEME OF EXAMINATION

SEM	SUBJECT CODE	PART	COURSE	SUBJECT TITLE	HRS/ WEEK	CREDIT	INT MARKS	EXT MARKS	MARKS
I	08U1LT1/LA1/ LH1/LU1/LF1	I	Language I	Language I	6	3	25	75	100
	08U1LE1	II	English I	English I	6	3	25	75	100
	08UCA1301	III	Allied I	Basic Mathematics and Statistics	5	3	25	75	100
	08UCA1401	III	Core I (a)	C Programming Lab	3	3	24	36	60
	08UCA1401:P	III	Core I (b)	PC Packages Lab	3	2	16	24	40
	08UCA1402	III	Core II	Principles of Programming	5	4	25	75	100
	08UCA1701	IV	Skill Based Elective I	Office Automation	2	2	25	75	100
TOTAL					30	20	165	435	600
II	08U2LT2/LA2/ LH2/LU2/LF2	I	Language II	Language II	6	3	25	75	100
	08U2LE2	II	English II	English II	6	3	25	75	100
	08UCA2302	III	Allied II	Digital Principles and Applications	5	3	25	75	100
	08UCA2303	III	Allied III	Operations Research	5	4	25	75	100
	08UCA2403	III	Core III	COBOL Programming	6	4	40	60	100
	08U29	IV	Environmental Studies		2	2	25	75	100
TOTAL					30	19	165	435	600
III	08U3LT3/LA3/ LH3/LU3/LF3	I	Language III	Language III	6	3	25	75	100
	08U3LE3	II	English III	English III	6	3	25	75	100
	08UCA3304	III	Allied IV	Principles of Accountancy	5	3	25	75	100
	08UCA3404	III	Core IV	Object Oriented Programming with C++	5	4	25	75	100
	08UCA3405:P	III	Core V	COBOL Programming Lab	4	4	40	60	100
	08UCA3702	IV	Skill Based Elective II	Web Design	2	2	25	75	100
	08UCA3601	IV	Non Major Elective I	Web Design	2	2	25	75	100
TOTAL					30	21	190	510	700
IV	08U4LT4/LA4/ LH4/LU4/LF4	I	Language IV	Language IV	6	3	25	75	100
	08U4LE4	II	English IV	English IV	6	3	25	75	100
	08UCA4305	III	Allied V	Organization Behaviour	5	3	25	75	100
	08UCA4306	III	Allied VI	Computer Architecture	5	4	25	75	100
	08UCA4406:P	III	Core VI	C++ Programming Lab	4	4	40	60	100
	08UCA4602	IV	Non Major Elective II	Multimedia and its Applications	2	2	25	75	100
	08U410	IV	Value Education		2	2	25	75	100
	08U411	V	Extension		--	1	--	--	--
TOTAL					30	22	190	510	700
V	08UCA5407	III	Core VII	Java Programming	6	5	25	75	100
	08UCA5408	III	Core VIII	Database Management System	5	5	25	75	100
	08UCA5409	III	Core IX	Visual Programming	5	5	25	75	100
	08UCA5410:P1	III	Core X (a)	Java Programming Lab	3	3	24	36	60
	08UCA5410:P2	III	Core X (b)	Web Design Lab	2	2	16	24	40
	08UCA5501	III	Major Based Elective I	Multimedia Technology	5	5	25	75	100
	08UCA5703	IV	Skill Based Elective III	E-Commerce	2	2	25	75	100
	08UCA5704	IV	Skill Based Elective IV	PC Hardware & Troubleshooting	2	2	25	75	100
TOTAL					30	29	190	510	700
VI	08UCA6411	III	Core XI	Computer Networks	5	5	25	75	100
	08UCA6412	III	Core XII	Software Engineering	5	5	25	75	100
	08UCA6413:P	III	Core XIII	Software Development Lab	6	5	40	60	100
	08UCA6502	III	Major Based Elective II	WAP and WML	5	5	25	75	100
	08UCA6503	III	Major Based Elective III	Operating Systems	5	5	25	75	100
	08UCA6705:P	IV	Skill Based Elective V	Tally Lab	2	2	40	60	100
	08UCA6706	IV	Skill Based Elective VI	Shell Programming	2	2	25	75	100
TOTAL					30	29	205	495	700
For Complete Course					180	140	1105	2895	4000

Semester : I
Code : 08UCA1301

Hours/week : 5
Credits : 3

Allied-I : BASIC MATHEMATICS AND STATISTICS

Objectives: To provide knowledge of various branches of business mathematics and to motivate the students to apply the techniques.

UNIT-I

Mathematical Logic - Logical Statements, Types, Negation of Proposition, Conditional, Inverse, Converse, Contrapositive of Proposition - Logical Equivalence - The Algebra of Propositions - Propositional Calculus - Disjunction - Conjunction - Tautologies and Contradictions – Arguments.

UNIT-II

Set Theory - Types of Sets - Types of Set Operations - Properties of the Operations - Cartesian Product - Relations - Equivalence Relations - Partition - Partial Order Relation – Functions - Inverse Mapping - Composition of Mappings – Binary Operations - Countable and Uncountable Sets.

UNIT-III

Diagrammatic and Graphical Representation of Numerical Data - Formation of Frequency Distribution - Histogram, Cumulative Frequency – Polygon and Ogives - Measures of Central Tendency - Measures of Dispersion - Moments and Measures of Skewness and Kurtosis.

UNIT-IV

Theory of Probability - Definitions of Probability - Sample Space - Probability of an Event - Independence of Events - Theorems on Probability - Conditional Probability - Baye's Theorem.

UNIT-V

Correlation and Regression - Properties of Correlation and Regression Coefficients - Numerical Problems for Finding The Correlation and Regression Coefficients.

Text Books:

1. B.S. Vatsa, *Discrete Mathematics*, Wishwar Prakashan - A Division of Wiley Eastern Ltd., New Delhi, Second Edition, 1988
2. S.C. Gupta, V.K. Kapoor, *Fundamentals of Mathematical Statistics*

Semester : I
Code : 08UCA1401

Hours/week : 3
Credits : 3

Core-I(a) : PROGRAMMING IN C

Objectives: To learn the syntax of all the statements and to provide programming skills in C.

UNIT-I

Evolution and Basic Structure of C Programs – Data Types – Variables – Operators – Library Functions.

UNIT-II

Decision Making and Branching Statements – Looping Statements – User Defined Functions.

UNIT-III

Arrays – Strings – Structures – Unions

UNIT-IV

Pointers – Pointer Expressions – Pointers and Arrays – Pointers and Functions – Pointers and Structures.

UNIT-V

Files – I/O Operations on Files – Random Access Files .

Text Book:

E. Balagurusamy, *Programming in ANSI C*, Tata McGrawHill Publishing Company, Second Edition.

Core-I (a) : C PROGRAMMING LAB

1. Simple Programs
 - (i) Simple Interest
 - (iii) Calculating area of rectangle, square and triangle
2. Programs using *if–else* Statement
 - (i) Program to find odd or even of a given number
 - (ii) Program to find biggest of three numbers(using & without using logical operators)
3. Programs using Loop control structure (for, while and do while Loop)
 - (i) Sum of digits & Factorial of a given number using loops.
4. Programs using Switch control structure
 - (i) To simulate simple calculator.
5. Programs using functions
 - (i) To find the value of nCr (using recursion).
 - (ii) Swapping two number using function and pointers.(Call by reference)
7. Programs using Arrays
 - (i) Matrix Manipulations (Addition, Subtraction and Multiplication)
 - (ii) Sorting numbers (Ascending and Descending)
8. String manipulations (without using string functions)
 - (i) Palindrome
 - (ii) Alphabetical order
9. Program using files:
 - (i) Payroll Preparation
 - (ii) Mark Sheet Preparation

Semester : I
Code : 08UCA1402

Hours/week : 5
Credits : 4

Core-II : PRINCIPLES OF PROGRAMMING

Objectives: To learn the syntax of all the statements and to provide programming skills in C.

UNIT-I

Evolution and Basic Structure of C Programs – Data Types – Variables – Operators – Library Functions.

UNIT-II

Decision Making and Branching Statements – Looping Statements – User Defined Functions.

UNIT-III

Arrays – Strings – Structures – Unions

UNIT-IV

Pointers – Pointer Expressions – Pointers and Arrays – Pointers and Functions – Pointers and Structures.

UNIT-V

Files – I/O Operations on Files – Random Access Files .

Text Book:

E. Balagurusamy, *Programming in ANSI C*, Tata McGrawHill Publishing Company, Second Edition.

Semester : I
Code : 08UCA1701

Hours/week : 2
Credits : 2

Skill Based Elective-I : OFFICE AUTOMATION

Objectives : To understand the basic concepts MS-Windows, MS-Word, MS-Excel and MS-PowerPoint

UNIT-I

MS-WINDOWS - Using Windows - Using Windows Explorer, My Computer, Desktop & Network Neighborhood - Find files and folders - Properties of Taskbar - Using Internet Explorer, and Control Panel, Display Properties.

UNIT-II

MS-WORD -Word basics - Formatting text and documents - Working with headers, footers and foot notes - Tabs, Tables and Sorting.

UNIT-III

Working with Graphics - Templates and Wizards - Creating Macros and Menus - Mail merge.

UNIT-IV

MS-EXCEL - Excel Basics - Arranging Worksheets - Functions - Chart and its features - Graphics - Macros - Data Filler, Sort - Share workbook - Formatting Cells.

UNIT-V

MS-POWERPOINT - Creating a new slide - Formatting text and slide, working with slide show - Insert files, picture, textbox sounds, Chart and Object - Different slide views - Using Auto correct, Auto format and Macros.

Text Books:

1. Andy Rathbone and Sharon, *Windows 2000 Professionals for Dummies*.
2. Stephen L.Nelson and Peter, *The Complete Reference MS Office '97*.

Semester : II
Code : 08UCA2302

Hours/week : 5
Credits : 3

Allied-II : DIGITAL PRINCIPLES & APPLICATIONS

Objectives: To understand the principles of digital logic circuits and their design.

UNIT I

Number Systems – Decimal, Binary, Octal and Hexadecimal systems – Conversion from One System to Another.
– Binary Addition, Subtraction, Multiplication and Division – Binary Codes – 8421, 2421, Excess-3, Gray, BCD
– Alphanumeric Codes – Error Detection Codes .

UNIT II

Basic Logic Gates – Universal Logic – Boolean Laws and Theorems – Boolean Expressions – Sum of Products –
Product of Sums – Simplification of Boolean Expressions – Karnaugh Map Method – Implementation of Boolean
Expressions using gate networks.

UNIT III

Combinational Circuits – Multiplexers – Demultiplexers – Decoders – Encoders – Arithmetic Building Blocks –
Half and Full Adders – Half and Full Subtractors – Parallel adder – 2's Complement Adder-Subtractor – BCD
Adder.

UNIT IV

Sequential Circuits – Flip Flops – RS, Clocked RS, D, JK, T and Master-Slave Flip Flops – Shift Register –
Counters – Asynchronous and Synchronous counters – Mod n Counter – Ring Counter.

UNIT V

Microprocessors : Introduction – Intel 8085 Architecture – Instruction Formats – Addressing Modes – Instruction
Set : Data Transfer Instructions – Arithmetic & Logic Instructions – Jump Instructions – Simple Programs (8-bit
Addition, Subtraction, Multiplication, Division, Multibyte Addition, Multibyte subtraction, Sum of Series, Block
Data Transfer, Biggest and Smallest Number)

Text Books

1. Albert Paul Malvino and Donald P. Leach, *Digital Principles and Applications*, Tata McGraw Hill, Fourth Edition, 1996.
2. Badri Ram, *Fundamentals of Microprocessors and Microcomputers*, Fifth Edition, Dhanpat Rai Publications – 2003.

Semester : II
Code : 08UCA2303

Hours/week : 5
Credits : 4

Allied-III : OPERATIONS RESEARCH

Objectives: To provide an overall idea about the various operations research techniques and their applications.

UNIT-I

Operations Research - Definitions of O.R. - Significant Features of OR - Uses of OR - Applications of OR - Linear Programming Problem - Mathematical Formulation of the problem – Graphical Solution Method.

UNIT-II

Solutions of LPP - Simplex Method - Use of Artificial Variables - Charne's Big-M Method - Two Phase Simplex Method.

UNIT-III

Transportation Problem - General Structure of a T.P - Finding Initial BFS - NWC rule - Row Minima - Column Minima – Matrix Minima - VAM - Assignment Problem - Mathematical Statement of the Problem - Solving Assignment Problem by Hungarian Method.

UNIT-IV

Sequencing Problems – Processing of n Jobs through 2 Machines – Processing of n Jobs through 3 Machines – Processing of 2 Jobs through m Machines.

Game theory – Characteristics of Games – Two-Person Zero – Sum Games – Maximin – Minimax Principle – Games without Saddle Points – Mixed Strategies – Graphical Solution of Solving $2 \times n$ and $m \times 2$ Games – Dominance Property.

UNIT-V

Network Scheduling by PERT / CPM – Basic Concept – Construction of Networks – Critical Path Method – Computation of Various Floats – PERT Algorithm – Statistical Considerations – Comparison of PERT and CPM.

Text Book:

Kanti Swarup, P.K. Gupta and Man Mohan, Operations Research, Sultan Chand and Sons Publishers, New Delhi, 1992.

Reference Books:

1. *Hamdy A. Taha, Operations Research - An Introduction, Macmillan Publishing Co.*
2. *S. Dharani Venkatakrishnan, Operations Research Principles and Problems, Keerthi Publishing House Pvt. Ltd., Coimbatore, Third Edition, 1992.*

Semester : II
Code : 08UCA2403

Hours/week : 6
Credits : 4

Core-III : PROGRAMMING IN COBOL

Objectives: To give the syntax of statements in COBOL language. To impart the programming skills in COBOL.

UNIT-I

Introduction to COBOL – Coding Format – Structure of a COBOL program – Character Set – COBOL Words – Data Names and Identifiers – Literals – Figurative Constants – IDENTIFICATION DIVISION – ENVIRONMENT DIVISION – DATA DIVISION – Level Structure – Data Description Entries – FILE SECTION – WORKING-STORAGE SECTION – Editing.

UNIT-II

Structure of the PROCEDURE DIVISION – Data Movement Verb: MOVE – Arithmetic Verbs – ADD – SUBTRACT – MULTIPLY – DIVIDE – COMPUTE - Sequence Control Verb – GO TO – STOP - Input and Output Verbs – OPEN – READ – WRITE – CLOSE – ACCEPT – DISPLAY - Conditional Verb: IF - Simple COBOL programs.

UNIT-III

More about DATA DIVISION – JUSTIFIED Clause – REDEFINES Clause – RENAMEs Clause – Elementary and Group Moves – MOVE CORRESPONDING – Conditional Sequence Control verb – Condition – Types of Condition – Nested IF – GO TO with DEPENDING Phrase.

UNIT-IV

PERFORM statement - Table Handling – OCCURS clause and subscripting – Assigning Values to Table Elements – Multi-dimensional Tables – PERFORM Verb and Table Handling – PERFORM with TIMES option – PERFORM with UNTIL option – PERFORM with VARYING option.

UNIT-V

File Characteristics – File-control Entries for Sequential Files – File Description – Fixed Length Records – Statements for Sequential Files - The simple SORT verb – The simple MERGE verb.

Text Book:

M.K. Roy, D. Ghosh Dastidar, *COBOL Programming*, Tata McGraw-Hill Publishing Company Limited, New Delhi, Second Edition.

UNIT I : 3.1 – 3.8, 4.1, 4.2, 5.1 – 5.6

UNIT II : 6.1 – 6.6

UNIT III : 8.3 – 8.5, 9.1, 9.2.1, 10.1, 10.2, 10.2.1, 10.3

UNIT IV : 10.5, 11.1 – 11.4

UNIT V : 13.1 – 13.4, 14.1, 14.4

Reference Book:

A.S. Philippakis and Leonard J. Kazmier, *Structured COBOL*, McGraw-Hill International Editions, Third Edition.

Semester : III
Code : 08UCA3304

Hours/week : 5
Credits : 3

Allied-IV : PRINCIPLES OF ACCOUNTANCY

Objectives: To provide the basic knowledge of the financial accounting including double entry book keeping, preparation of journal, subsidiary book, ledger, trial balance and balance sheet.

UNIT-I

Meaning of accounting – Meaning and objects of book keeping – Accounting concepts and Conventions – Principles of double entry – Kinds of account – Journal and ledger accounts.

UNIT-II

Subsidiary books – Purchase book, Sales book, Purchase returns book, Bills receivable book, Bills payable book, Cash book, Analytical Petty cash book and Journal proper – Bank Reconciliation Statement.

UNIT-III

Trial balance – Preparation – Errors disclosed and errors not disclosed by its suspense account – Rectification of errors.

UNIT-IV

Preparation of final accounts – Trading account, Profit and loss account, Balance sheet – Adjusting and closing entries.

Methods of Depreciation (fixed percentage on original cost methods and diminishing balance method only)

UNIT-V

Bills of exchange – Bill transaction, Discounting endorsement – Sending bill for collection, noting of a bill, renewal of a bill – Insolvency of acceptor.

80% - Problems
20% - Theory

Text Book:

N. Vinayakam, P.L. Mani, K.L. Nagarajan, *Principles of Accountancy*, EURASIA Publishing House (PVT) Ltd., New Delhi, Revised Edition, 2002.

Semester: III

Hours/week : 5

Code : 08UCA3404

Credits : 4

Core - IV : OBJECT ORIENTED PROGRAMMING WITH C++

Objectives: To give the concepts of Object Oriented Programming, the syntax of statements in C++ language and to impart the programming skills in C++.

UNIT-I

Object Oriented Programming – Software Evolution – Basic Concepts – Benefits – Applications – Structure of C++ program – tokens – keywords – Identifiers and Constants – Basic Data Types – User Defined Data Types – Derived Data Types – Variables – Manipulators – Expressions and their types – Control Structures.

UNIT-II

Functions – Main Function – Function Prototyping – Call by Reference – Return by Reference – Inline Functions – Default Arguments – Function Overloading.

Classes and Objects – Specifying a Class – Defining Member Functions – A C++ program with Class – Static Members – Arrays of Objects – Objects as Function Arguments – Friendly Functions – Returning Objects.

UNIT-III

Constructors and Destructors – Parameterized Constructors – Multiple Constructors in a Class – Copy Constructors – Destructors – Defining Operator Overloading – Overloading Unary Operators – Overloading Binary Operators – Using Friend Function – Rules for Overloading Operators.

UNIT-IV

Inheritance – Defining Derived Classes – Single Inheritance – Multilevel Inheritance – Multiple Inheritance – Virtual Base Classes – Pointers to Objects – this pointer – Pointer to Derived Classes – Virtual Functions and Polymorphism – Pure Virtual Function.

UNIT-V

Managing Console I/O Operations – C++ Streams – C++ Stream Classes – Unformatted I/O Operations – Formatted Console I/O Operations – Working with Files – Classes for File Stream Operations – Opening and Closing a File – Detecting End-of File – File Modes.

Text Book:

E. Balagurusamy, *Object-Oriented Programming with C++*, Tata McGraw-Hill Publishing Company Limited, New Delhi, Third Edition.

Core-V : COBOL PROGRAMMING LAB

1. Program to compute simple interest and compound interest using
 - a) COMPUTE verb
 - b) Arithmetic verbs
2. Program to find the biggest of three numbers using
 - a) IF ... ELSE statement
 - b) Nested IF statement.
3. a) Program to find the given number is odd or even.
b) Program to convert the temperature given in Fahrenheit into Celsius.
4. Program to determine the following using PERFORM with UNTIL option.
 - a) Sum of digits of a given number.
 - b) Factorial of a given number.
5. The following table shows three categories of employees working in a University and their PF contributions with their category code. Write a program to compute the PF contribution using GO TO with DEPENDING Phrase.

Category	PF
Professor	20 % of Basis Pay
Reader	15 % of Basic Pay
Lecturer	10 % of Basic Pay

6. Program to find largest of 'N' given numbers using OCCURS clause.
7. Program to create and process the following applications using sequential files :
 - a) Mark list preparation
 - b) Payroll preparation
 - c) Electricity bill preparation
8. Program to sort a file.
9. Program to merge the files.

Semester : III
08UCS3702

Hours/week : 2 Code :
Credits : 2

Skill Based Elective-II : WEB DESIGN

Objectives: To present the fundamental concepts of Internet, Internet Technologies, Network Topologies and to give the knowledge on HTML.

UNIT-I

Introduction to Internet - Computers in business, Networking, Internet, E-mail, Resource sharing, Gopher, World Wide Web, Usenet, Telnet, Bulletin Board Service, Wide Area Information Service.

UNIT-II

Internet Technologies - Modem, Internet Addressing, Physical Connections, Telephone Lines. Internet Browsers - Internet Explorer, Netscape Navigator.

UNIT-III

How Computers Communicate, Understanding Network Topologies - Star Topology, Ring Topology, Bus Topology, Comparing Network Topologies, Understanding Token passing, Connecting Computer Networks - Repeater, Bridge

UNIT-IV

Introduction to HTML - History of HTML, HTML Documents, Anchor Tag, Hyper Links. Head and body sections - Header Section - Title, Prologue, Links, Colorful Web Page, Comment Lines.

UNIT-V

Designing Body Sections -Heading printing, Aligning the headings, Horizontal rule, Paragraph, Tab Settings, Lists, Unordered Lists, Ordered Lists.

Text Books:

1. C. Xavier , *World Wide Web Design with HTML*, Tata McGraw-Hill Publishing.
2. Kris Jamsa and Ken Cope, *Internet Programming*

Semester: III

Hours/week : 5

Code : 08UCA3603

Credits : 3

Non Major Elective-III : PROGRAMMING IN C++

Objectives: To give the concepts of Object Oriented Programming, the syntax of statements in C++ language and to impart the programming skills in C++.

UNIT I

Object Oriented Programming – Software Evolution – Basic Concepts – Benefits – Applications – Structure of C++ program – tokens – keywords – Identifiers and Constants – Basic Data Types – User Defined Data Types – Derived Data Types – Variables – Manipulators – Expressions and their types – Control Structures.

UNIT II

Functions – Main Function – Function Prototyping – Call by Reference – Return by Reference – Inline Functions – Default Arguments – Function Overloading.

Classes and Objects – Specifying a Class – Defining Member Functions – A C++ program with Class – Static Members – Arrays of Objects – Objects as Function Arguments – Friendly Functions – Returning Objects.

UNIT III

Constructors and Destructors – Parameterized Constructors – Multiple Constructors in a Class – Copy Constructors – Destructors – Defining Operator Overloading – Overloading Unary Operators – Overloading Binary Operators – Using Friend Function – Rules for Overloading Operators.

UNIT IV

Inheritance – Defining Derived Classes – Single Inheritance – Multilevel Inheritance – Multiple Inheritance – Virtual Base Classes – Pointers to Objects – this pointer – Pointer to Derived Classes – Virtual Functions and Polymorphism – Pure Virtual Function.

UNIT V

Managing Console I/O Operations – C++ Streams – C++ Stream Classes – Unformatted I/O Operations – Formatted Console I/O Operations – Working with Files – Classes for File Stream Operations – Opening and Closing a File – Detecting End-of File – File Modes.

Text Book:

E. Balagurusamy, *Object-Oriented Programming with C++*, Tata McGraw-Hill Publishing Company Limited, New Delhi, Third Edition.

Semester : IV
Code : 08UCA4306

Hours/week : 5
Credits : 4

Allied-VI : COMPUTER ARCHITECTURE

Objectives: To understand the principles of digital logic circuits & their design. To understand the working of a central processing unit architecture of a computer.

UNIT-I

Register Transfer and Micro Operations: Register Transfer Language – Register Transfer – Bus and Memory Transfer – Arithmetic Micro operations – Logic Micro operations – Shift Micro operations – Arithmetic Logic Shift Unit.

UNIT-II

Basic Computer Organization and Programming: Instruction Codes – Computer Registers – Computer Instructions – Timing and Control – Memory Reference Instructions – Input-Output and Interrupt – Machine Language – Assembly Language – The Assembler.

UNIT-III

Central Processing Unit: General Register Organization – Stack Organization – Instruction Formats – Addressing Modes – Data Transfer and Manipulation – Program Control.

UNIT-IV

Input-Output Organization: Peripheral Devices – Input-Output Interface – Asynchronous Data Transfer: Strobe Control – Handshaking – Asynchronous Serial Transfer – Modes of Transfer – Direct Memory Access – Input-Output Processor: CPU-IOP Communication.

UNIT-V

Memory Organization: Memory Hierarchy – Main Memory – Auxiliary Memory – Associative Memory – Cache Memory – Virtual Memory.

Text Book:

Morris Mano M, *Computer System Architecture*, Pearson Education, Third Edition.

Unit-I : 4.1 – 4.7

Unit-II : 5.1 – 5.4, 5.6 – 5.7, 6.1 – 6.4

Unit-III: 8.1 – 8.7

Unit-IV: 11.1 – 11.4, 11.6 – 11.7

Unit-V : 12.1 – 12.6

Semester : IV
Code : 08UCA4404

Hours/week : 3
Credits : 3

Core-IV (a) : PROGRAMMING IN C++

Objectives: To give the concepts of Object Oriented Programming, the syntax of statements in C++ language and to impart the programming skills in C++.

UNIT-I

Object Oriented Programming – Software Evolution – Basic Concepts – Benefits – Applications – Structure of C++ program – tokens – keywords – Identifiers and Constants – Basic Data Types – User Defined Data Types – Derived Data Types – Variables – Manipulators – Expressions and their types – Control Structures.

UNIT-II

Functions – Main Function – Function Prototyping – Call by Reference – Return by Reference – Inline Functions – Default Arguments – Function Overloading.

Classes and Objects – Specifying a Class – Defining Member Functions – A C++ program with Class – Static Members – Arrays of Objects – Objects as Function Arguments – Friendly Functions – Returning Objects.

UNIT-III

Constructors and Destructors – Parameterized Constructors – Multiple Constructors in a Class – Copy Constructors – Destructors – Defining Operator Overloading – Overloading Unary Operators – Overloading Binary Operators – Using Friend Function – Rules for Overloading Operators.

UNIT-IV

Inheritance – Defining Derived Classes – Single Inheritance – Multilevel Inheritance – Multiple Inheritance – Virtual Base Classes – Pointers to Objects – this pointer – Pointer to Derived Classes – Virtual Functions and Polymorphism – Pure Virtual Function.

UNIT-V

Managing Console I/O Operations – C++ Streams – C++ Stream Classes – Unformatted I/O Operations – Formatted Console I/O Operations – Working with Files – Classes for File Stream Operations – Opening and Closing a File – Detecting End-of File – File Modes.

Text Book:

E. Balagurusamy, *Object-Oriented Programming with C++*, Tata McGraw-Hill Publishing Company Limited, New Delhi, Third Edition.

UNIT I : 1.2, 1.5, 1.6, 1.8, 2.6, 3.1 – 3.24

UNIT II : 4.1 – 4.7, 4.9, 5.3 – 5.5, 5.11 – 5.16

UNIT III : 6.1 – 6.4, 6.7, 6.11, 7.1 – 7.5, 7.7

UNIT IV : 8.1 – 8.3, 8.5, 8.6, 8.9, 9.1 – 9.7

UNIT V : 10.1 – 10.5, 11.1 – 11.5

Reference Book:

Robert Lafore, *Object-Oriented Programming in Turbo C++*, Galgotia Publications Pvt. Ltd., New Delhi.

Semester : V
Code : 08UCA5407

Hours/week : 6
Credits : 5

Core-VII : JAVA PROGRAMMING

Objectives: *To understand the basic concepts of Object Oriented Programming with Java language*

UNIT-I

Introduction to Java Programming – Overview of Java Technology – Features of Java – The Building Blocks of Java – Data Types – Variable Declarations – Wrapper Classes – Operators and Assignment – Control Structures – Arrays – Strings.

UNIT-II

Java as an OOP Language – Defining Classes – Modifiers – Packages – Interfaces.

UNIT-III

Exception Handling – Basics of Exception Handling in Java – Exception Hierarchy – Constructors and Methods in Throwable Class – Unchecked and Checked Exceptions – Handling Exceptions in Java – Exception and Inheritance – Throwing User-defined Exceptions – Multithreading – Overview of Threads – Creating Threads – Thread Life-cycle – Thread Priorities and Thread Scheduling – Thread Synchronization.

UNIT-IV

Files and I/O Streams – Overview of I/O Streams – Java I/O – File Streams – FileInputStream and FileOutputStream – Filter Streams – RandomAccessFile – Serialization.

UNIT-V

Applets – Java Application Versus Java Applets – Applet Life-cycle – Working with Applets – The HTML APPLET Tag – The java.Applet package – The Abstract Window Toolkit : Basic Classes in AWT – Class Hierarchy in AWT – Event Handling – AWT Controls – Layout Managers.

Text Book:

P. Radha Krishna, *Object Oriented Programming through JAVA*, Universities Press, 2007.

Reference Book:

Herbert Schildt, *The Complete Reference Java 2*, TMH, 3rd Edition.

Semester : V
08UCA5408

Hours/Week : 5 Code :
Credits : 5

Core-VIII : DATABASE MANAGEMENT SYSTEMS

Objectives: To provide the concepts of database management systems and RDBMS including transaction management and concurrency control.

UNIT-I

Introduction to Database Management Systems – Data and Data Management – File-based Data Management – Database Systems – Organization of a Database – Characteristics of Data – DBMS – Functions – Components – Data Dictionary – Database Users – Database Architecture – Data Abstraction – Data Independence – Database Languages – Database Design – Design Constraints – Data Models – Conceptual, Physical, and Logical Database Models, Relationships – Hierarchical, Network, Relational, E-R, and Object-oriented Models.

UNIT-II

E-R Modeling – Components of an E-R Model – Relationships – E-R Diagrams. RDBMS: Terminology – Relational Data Structure – Relational Data Manipulation – Codd's Rules – Relational Data Integrity and Database Constraints – Data Normalization – Pitfalls in Relational Database Design – Decomposition – Functional Dependencies – Normalization – Keys – First, Second, Third and Boyce-Codd Normal Forms.

UNIT-III

Relational Algebraic Operations – Relational Calculus – Domain Relational Calculus. SQL: Characteristics – Advantages – Types of SQL Commands – SQL Operators – Tables and Views – Queries and Subqueries – Aggregate Functions.

UNIT-IV

Files, File Organization and File Structures – Operations on Files – File Storage Organization – File Organization – File Structure – Record Types – Indexing – Hashing – Database Security – Database Environment – Data Security Risks – Data Security Requirements – Protecting the Data within the Database.

UNIT-V

Transaction Management and Concurrency Control – Transactions – ACID Properties – Database Structure – Transaction States – Concurrency Control – Serializability – Recoverability – Concurrency Control Schemes – Transaction Management in SQL – Transactions and Recovery – User-defined Transactions – The COMMIT, ROLLBACK and SAVEPOINT Commands – Backup and Recovery.

Text Book:

Alexis Leon & Mathews Leon, *Essentials of Database Management Systems*, Vijay Nicole Imprints Private Limited.

Semester : V
08UCA5409

Hours/Week : 5 Code :
Credits : 5

Core-IX : VISUAL PROGRAMMING

Objective : To understand the concepts of Visual Basic and to develop simple applications.

UNIT-I

Features of Visual Basic – The Visual Basic Philosophy – Developing an Application – Creating an Application – The Tool Box – Project Explorer – The properties Window – The Form Window – Understanding Projects – What does Visual Basic 6 have for you to create applications? – The Form – Working with a Control – Opening the Code Window.

UNIT-II

Variables in Visual Basic – Writing Code in Visual Basic – The Code Window – The Anatomy of a Procedure – Editor Features – Visual Basic File System Controls – Types of Files – Working with Files.

UNIT -III

Menus – Building the User Interface – All About Menus – Multiple Document Interface Applications – Features of an MDI Form – Loading MDI Forms and Child Forms – The Active Form Property – Debugging Tips – The Debugging Methods.

UNIT-IV

The Common Dialog Control – The Data Control – The Bound Controls – Coding – Data Access Objects – The Jet Data base Engine – Functions of the Jet Database Engine – SQL – The DAO Object Model.

UNIT-V

Additional Controls – The Image Control – The Strip Control – MS Flex Grid Control – Toolbar Control – The Status Bar Control – The View Control – Slider Control – Mask Edit Box Control – ActiveX Data Objects – Need of ADO – Establishing a Reference.

Text Book:

Mohamed Azam, *Programming with Visual Basic 6.0*, Vikas Publishing House Pvt. Ltd., 2005.

Core-X (a) : JAVA PROGRAMMING LAB

1. Simple Programs using Control Statements
 - a) Biggest among the 3 numbers using if..else statement
 - b) Sum of the digits using while and do..while loop
 - c) Sorting the set of elements using for loops
 - d) Perform all the arithmetic operations using switch statement
2. Simple Programs using Recursive Functions
 - a) Factorial of the given number
 - b) nCr value of the given numbers
3. Program using String Handling functions
 - a) Count the number of vowels, consonants and words in a given sentence
 - b) Arrange the set of names in Alphabetical order
4. Classes and Objects
 - a) Define a class Circle and find out the area and circumference of a circle.
[Use overloaded Constructors and static constant value of PI]
 - b) Define a class Complex and pass the Complex type objects to add() method and it should return a same type object as return value.
5. Inheritance, Interfaces and Packages
 - a) Program using single Inheritance
 - b) Program using Multiple Inheritance
 - c) Prepare a student information system using set of classes in a package
6. Multithreading
 - a) Create a Thread using Thread class
 - b) Create a Thread using Runnable Interface
7. Exception Handling
 - a) Write Java Programs to handle the following Exceptions
 - i. DivideByZeroException
 - ii. ArrayIndexOutOfBoundsException
 - iii. NumberFormatException
 - iv. NullPointerException
8. Streams and Applet
 - a) Program to copy the characters from one file in to another File
 - b) Program to concatenation of two files
 - c) An Applet program to prepare a BIO-DATA format
 - d) An Applet program to display geometrical objects

Core-X (b) : WEB DESIGN LAB

1. Develop a HTML document and perform the basic alignments on the headers and format the document using suitable tags
2. Develop a HTML document to display the advantages and disadvantages of Internet using ordered and unordered list tags facilities.
3. Develop a home page for your company with suitable name, logo, pictures, background design and color text with links.
4. Design a web page of your meals menu for a week using table tag with its attributes.
5. Develop a simple application by using frame controls.
6. Develop a web page to display the Resume registration form with suitable controls.
7. Develop a JavaScript that reads five integers and determines the largest and the smallest integers in the group.
8. Develop a JavaScript for a recursive function to calculate the Fibonacci value of a given number.
9. Develop a JavaScript function to display current date and time using date object.
10. Develop a VBScript to add two integers.
11. Develop a VBScript to validate an HTML form.
12. Develop a VBScript to show how to set up multiple values for a cookie.

Semester : V

Hours/week : 4

Code : 08UCA5502

Credits : 4

Elective-II : MULTIMEDIA AND ITS APPLICATIONS

Objectives: To understand the concepts and technologies involved in Multimedia and its applications.

UNIT-I

Introduction: What is Multimedia? – The Multimedia Market – Content and Copyright – Resources for Multimedia Developers – Products and Evaluation: Types of Products – Evaluation

UNIT-II

Multimedia Hardware, Software and Platforms: Computer Architecture – Standards- Operating Systems and software – Multimedia Computer Architecture –

Text: Elements of Text – Text Data files – Using Text in Multimedia Applications – Hypertext

UNIT-III

Graphics: Elements of Graphics – Images and Color – Graphics file and application formats – Obtaining images for multimedia use – Using Graphics in Multimedia applications – Digital Audio: Characteristics of Sound and Digital Audio – Digital Audio systems – MIDI – Audio file formats – Using Audio in multimedia applications

UNIT-IV

Digital Video and Animation: Background on Video – Characteristics of Digital video – Digital video data sizing – Video capture and Playback systems – Computer Animation – Using Digital video in Multimedia Applications – Product Design: Building Blocks – Classes of Products – Content Organizational strategies – Storyboarding

UNIT-V

Multimedia and the Internet: The Internet – HTML and Web Authoring – Multimedia considerations for the Internet – Design considerations for Web pages – The Multimedia Development Team: Team Approach – Assembling a Multimedia Production Team

Text Book:

David Hillman, *Multimedia Technology and Applications*, David Hillman, Galgotia Publications (P) Ltd., 1998.

Semester : V
Code : 08UCA5703

Hours/week : 2
Credits : 2

Skill Based Elective-III : E-COMMERCE

Objectives: To provide the concepts of E-Commerce and its technologies, networking, internet and security issues.

UNIT-I

E-commerce and overview – Types of E-commerce solutions – Social and Ethical Issues surrounding E-commerce – Applications of E-Commerce

UNIT-II

Electronic Communication and Essential Tools for E-commerce: Data Communication – Forms of data transmission – Data Transmission techniques – Communication channel bandwidths – Types of communication channel – Transmission modes

UNIT-III

Networking: Types of Computer Networks – Network Topology – Basic elements of Networking – OSI Models – Client/Server Computing: File servers – Database servers – Communication servers – Uses of DBMS

UNIT-IV

Internet: TCP/IP Communication Architecture – Internet Architecture – Technologies in E-commerce systems: Electronic data interchange – Uses of EDI, Evolution, Benefits – Business features of EDI and Administration

UNIT-V

Security Issues and Electronic Payment Systems: Passwords, viruses, firewalls and encryption – Electronic Payment systems – ERP: Evolution, components, characteristics of ERP

Text Book:

S. Jaiswal, *E-Commerce*, Galgotia Publications Pvt. Ltd., 2001

Semester : V

Hours/week : 2

Code : 08UCA5703

Credits : 2

Skill Based Elective-III : PC HARDWARE AND TROUBLESHOOTING

Objectives: To provide the basic concepts of PC hardware components. To assemble and troubleshoot a PC.

UNIT-I

Introduction to Computer – Hardware & Software – Input, Process, Output – Basic Computer System – Main System Unit – Monitor – Keyboard – Mouse – Printer – Modem – Scanner – Laptop/Notebook/Portable Computer – Using the Computer – Starting the Computer.

UNIT-II

Modern Microprocessors – Memory – Primary Memory – Secondary Memory – Bits & Byte – RAM – ROM – Parity – ECC Memory – Physical Memory Organization – Memory Speed – Motherboard Memory Capacity – Extended Memory – Memory Speed Improvements – Upgrading/Adding Memory – Some Common Memory Errors.

UNIT-III

Motherboard – Motherboard Components – Chipsets – Pentium 4 Motherboard Installation – The Battery – Connectors on the Motherboard – Keeping CPU Cool – Motherboard Troubleshooting.

UNIT-IV

Keyboard – Keyboard Switch – Keyboard Organization – Keyboard Type – Troubleshooting Keyboard – Mouse – Mouse Type – Connecting Mouse – Mouse Resolution – Scroll Mouse/Wheel Mouse – Using a Mouse – Mouse Installation – Troubleshooting Mouse – Cleaning the Mouse – Swapping Mouse Buttons.

UNIT-V

Hard Disk Drive – Installing/Upgrading Hard Disk Drive (Hardware & Software Perspective) – HDD Troubleshooting – Making Your Own Computer.

Text Book:

Manohar Lotia, Pradeep Nair & Payal Lotia, *Modern Computer Hardware Course*, BPB Publications, Second Revised Edition, 2006.

Semester : VI
08UCA6411

Hours/Week : 5 Code :
Credits : 5

Core-XI : COMPUTER NETWORKS

Objectives: To learn the concepts of data communication technologies and computer networks. To understand the applications, management and security aspects in networks.

UNIT-I

Introduction: Applications – Computer Network Topologies – Categories of Networks – Networks – Network Architecture – OSI Model – TCP/IP Architecture. Communication Media and Data Transmission: Analog and Digital Data Transmission – Modulation and demodulation – Transmission Media – Transmission Modes – Interfacing – Multiplexing.

UNIT-II

Error Detection and Correction: Types of Errors – Error Detection – Error Correction. Data Link Control and Protocol Concepts: Flow Control – Error Control – Asynchronous Protocols – Synchronous Protocols HDLC. Integrated Services and Routing Protocols: Integrated Services – ISDN Services – ISDN Topology – ISDN Protocols – ATM – Characteristics – Frame Relay – Comparison of ISDN, ATM and Frame Relay.

UNIT-III

LAN: Types of Network and Topology – LAN Transmission Equipment – Ethernet – Token bus – Token ring – Fibre Distributed Data Interface – Distributed Queue Dual Bus – LAN Operating Systems and Protocols – Ethernet Technologies. WAN: Transmission Methods – Carrier Types – Transmission Equipment – Design and Multicast Considerations – Protocols.

UNIT-IV

Wireless LAN: Applications – Requirements – Planning – Architecture – IEEE 802.11 – Protocol Layer – Physical Layer – Designing the Wireless LAN Layout – WAP Services. Internetworking: Principles – Routing – Internetwork Protocols. TCP Reliable Transport Services: Transport Protocols – The Service TCP Provides to Applications – End-to-End Service and Datagrams – Transmission Control Protocol – User Datagram Protocol.

UNIT-V

Network Applications: Client-Server Model – DNS – Telnet – File Transfer and Remote File Access – Electronic Mail – World Wide Web. Network Management: Goal of Network Management – Standards – Network Management Model – Infrastructure for Network Management – Simple Network Management Protocol. Network Security: Fundamental Concepts – Identification and Authentication – Access Control – Network Security Model – Malicious Software.

Text Book:

Brijendra Singh, *Data Communications and Computer Networks*, PHI, Second Edition, 2006.

Semester : VI
Code : 08UCA6412

Hours/week : 5
Credits : 5

Core-XII : SOFTWARE ENGINEERING

Objectives : To provide knowledge of the various phases of software engineering process.

UNIT-I

Introduction to Software Engineering: Definitions, Size factors- Quality and Productivity Factors – Managerial Issues – Planning a Software Project: Defining the Problem – Developing a Solution Strategy – 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 Maintenance Costs – Software Requirements Definition: The Software Requirements Specification – Formal Specification Techniques – State Oriented Notations.

UNIT-III

Software Design: Fundamental design concepts – Modules and Modularization criteria – Design Notations – Design Techniques.

UNIT-IV

Implementation Issues: Structured coding techniques – Coding Style – Modern programming language Features: Type checking – Separate compilation – User-defined data types – Data abstraction – Scoping Rules.

UNIT-V

Verification and Validation Techniques: Quality Assurance – Walkthroughs and Inspections – Unit Testing and Debugging – System Testing – Formal Verification – Software Maintenance: Enhancing Maintainability during development – Managerial Aspects of Software maintenance.

Text Book :

Richard Fairley, *Software Engineering Concepts*, Tata McGraw- Hill Publishing Company, 1997

Reference Book:

Roger S. Pressman, *Software Engineering: A practitioner's approach*, Tata McGraw Hill International Edition, Fourth Edition

Semester : VI
Code : 08UCA6513:P

Hours/week : 6
Credits : 5

Core-XIII : SOFTWARE DEVELOPMENT LAB

Objectives: To provide basic knowledge of the real time projects of the IT industry. To develop mini real time softwares using any platforms such as Java, VB, .NET, etc.

Semester : VI
Code : 08UCA6502

Hours/week : 5
Credits : 5

Major Based Elective-II : WAP and WML

Objectives: To learn the concepts and security features of Wireless Application Protocol. To understand WML and WML script.

UNIT-I

Overview of WAP – WAP and the Wireless World – WAP Application Architecture – WAP Internal Structure – WAP Versus the Web – WAP 1.2 – STA and Push Features – WAP Gateways – Functionality of a WAP Gateway – The Web Model Vs the WAP Model – Positioning of a WAP Gateway in the Network – Selecting a WAP Gateway.

UNIT-II

Basic WML – eXtensible Markup Language – WML Structure – A Basic WML Card – Text Formatting – Navigation – Interacting with the User – Making a Selection – Events – Variables – Input and Output Parameter Passing.

UNIT-III

WML Script – Lexical Structure – Variable & Literals – Operators – Automatic Data Type Conversion – Control Constants – Functions – Using the Standard Libraries – Pragmas – Dealing with Errors – Usability – General Guidelines.

UNIT-IV

Java, XML and WAP – Introduction to Servlets – Introduction to JSP – Design Considerations – ColdFusion – WAP and ColdFusion – ColdFusion Studio/Homesite Editing Features for WAP Development.

UNIT-V

WAP Security – The Need for Security – Encryption Technologies – Comparing Security Models – Wireless Security Issues – TLS and WTLS – Future of Wireless Security – WTA – Fundamentals of WTA Architecture – WTA Interfaces – WTA State Model.

Text Book:

Charles Arehart, Nirmal Chidambaram and Others, *Professional WAP*, Shroff Publishers & Distributors Pvt. Ltd., 2000.

Semester : VI
Code : 08UCA6503

Hours/week : 5
Credits : 5

Major Based Elective-III : OPERATING SYSTEMS

Objectives : To provide fundamental concepts of all managements in an Operating System.

UNIT-I

Evolution of operating system-basic concepts & terminology –an operation system resource manager –views of operating system –types of operating system –I/O programming-Interrupt structure & processing –Interrupt types – Interrupt mechanism-Interrupt handle processing.

UNIT-II

Single contiguous allocation – example of multiprogramming-Partitioned memory management-Paged memory management-Demand paged memory management-Segmented memory management-Segmented and Demand paged memory management-Swapping and Overlays.

UNIT-III

Job scheduling – process scheduling functions – policies –multiprocessor systems-process synchronization –deadlock – avoidance- prevention –detection and recovery-Banker’s algorithm-Mutual Exclusion - semaphore mechanism.

UNIT-IV

Techniques for device management- device characteristics –hardware considerations- channels –control units I/O traffic controller- I/O Scheduler, I/O Device Handler.

UNIT-V

Simple file system- general model of a file system- logical file system-physical file system-Security threats and goals-Security policies and mechanisms -Case Studies : MS-DOS & UNIX (Commands , System calls & implementation).

Text Book :

1. Stuart E. Madnick & John J. Donovan, *Operating Systems*, McGraw Hill International Editions
2. Milan Milenkovic, *Operating System Concepts and Design*, Second Edition McGraw Hill International Editions

Reference Book:

Williamm Stallings, *Operating systems*, Second edition PHI-New Delhi, 2001

Semester : VI
Code : 08UCA6705:P

Hours/week : 2
Credit : 2

Skill Based Elective - V : TALLY LAB

1. Architecture and customization of Tally
2. Configuration of Tally
3. Tally Screens and Menus
4. Creation of new company and groups.
5. Preparation of voucher entries.
 - a. Payment voucher
 - b. Receipt voucher
 - c. Sales voucher
 - d. Purchase voucher
 - e. Contra voucher
 - f. Journal voucher
6. Ledger Creation
7. Preparation of Trail balance
8. Preparation of Profit and loss statement.
9. Preparation of Balance Sheet.
10. Preparation of Bank Reconciliation Statement

Semester : VI
Code : 08UCA6706

Hours/week : 2
Credits : 2

Skill Based Elective-VI : SHELL PROGRAMMING

Objectives : To provide the fundamental concepts of Unix and shell programming.

UNIT-I

Introduction to UNIX – Files and Commands – Directories – The Shell.

UNIT-II

The File System – The Basics of Files – Format of a File – Directories and Filenames – Permissions – Inodes – The Directory Hierarchy - Devices.

UNIT-III

Using the Shell – Command Line Structure – Metacharacters – Creating New Commands – Command Arguments and Parameters – Program Output as Arguments – Shell Variables – I/O Redirection – Looping in Shell Programs – `bundle` – Need of a Programmable Shell.

UNIT-IV

Filters – The `grep` Family – Other Filters –The Stream Editor `sed` – The `awk` Pattern Scanning and Processing Language – Good Files and Good Filters.

UNIT-V

Shell Programming – Customizing the `cal` Command – `which` Command – `while` and `until` loops – Traps – Replacing a File: `overwrite` – `zap` – The `pick` Command – The `news` Command – `get` and `put`.

Text Book :

Brian W. Kernighan, Rob Pike, *The Unix Programming Environment*, Pearson Prentice Hall, 2006.

Reference Book:

Mike Joy, Stephen Jarvis, Michael Luck, *Introducing Unix and Linux*, Palgrave Macmillan, 2007.