POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS

SYLLABUS – 2017

Under
CHOICE BASED CREDIT SYSTEM

Since 1951

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

JAMAL MOHAMED COLLEGE (AUTONOMOUS)

College with Potential for Excellence

Re-accredited (3rd Cycle) with 'A' Grade by NAAC

TIRUCHIRAPPALLI – 620 020

SEM.	SUBJECT CODE	COURSE	SUBJECT TITLE	HRS / WEEK	CREDIT	CIA MARK	SE MARK	TOTAL MARK
I	17PDCA1C1	Core I	Digital Computer Fundamentals	6	4	25	75	100
	17PDCA1C2	Core II	Programming in C and C++	6	4	25	75	100
	17PDCA1C3	Core III	Principles of Operating Systems	6	4	25	75	100
	17PDCA1C4	Core IV	Database Systems	6	4	25	75	100
	17PDCA1C5P1	Core V (a)	C and C++ Programming Lab	3	2	12	38	50
	17PDCA1C5P2	Core V (b)	PC Packages Lab	3	2	12	38	50
	TOTAL			**30**	**20**	**124**	**376**	**500**
II	17PDCA2C6	Core VI	Internet and its Applications	6	4	25	75	100
	17PDCA2C7	Core VII	Java Programming	6	4	25	75	100
	17PDCA2C8	Core VIII	Visual Programming	6	4	25	75	100
	17PDCA2C9	Core IX	Web Design	6	4	25	75	100
	17PDCA2C10P1	Core X (a)	Java Programming Lab	3	2	12	38	50
	17PDCA2C10P2	Core X (b)	Visual Programming Lab	3	2	12	38	50
	TOTAL			**30**	**20**	**124**	**376**	**500**
GRAND TOTAL				**60**	**40**	**248**	**752**	**1000**

Subject Code : 17PDCA1C1	**Max. Marks : 100**
Hours : 6	**Internal Marks : 25**
Credits : 4	**External Marks: 75**

Objectives

To acquire a thorough knowledge in the various concepts of digital computers and their fundamentals.

UNIT I

Number Systems: Decimal System – Counting in The Binary System – Binary Addition – Subtraction – Multiplication – Division – Converting Decimal to Binary – Use of Compliments To Represent Negative Numbers – Binary Number Complements – BCD Number Representation – Octal and Hexadecimal Number Systems.

UNIT II

Boolean Algebra and Gate Networks: Fundamental Concepts of Boolean Algebra – AND Gates and OR Gates- Complementation and Inverters – Evaluation of Logical Expressions – Basic Laws of Boolean Algebra – De Morgan's Theorem – Sum of Products and Product of Sums – NAND and NOR Gates – Map Method For Simplifying Expressions.

UNIT III

Logic Designs: Flip-Flops – Clocks – Flip-Flop Designs – Gated Flip-Flops- Master Slave Flip-Flop – Shift Register Binary Counter – BCD Counters – Integrated circuits.

UNIT IV

The Arithmetic Logic Unit: The Construction of The ALU – Binary Half-Adder – A Parallel Binary Adder – Addition and Subtraction in a Parallel Arithmetic Element – Full-Adder Designs – BCD Adder – Multiplexers.

UNIT V

Memory Unit: Random Access Memories – Decoders – Static and Dynamic Random Access Memories – Read Only Memories – Magnetic Disk Memories – Flexible-Disk Storage Systems – The floppy Disk – Magnetic Bubble and CCD Memories.

Text Book

Thomas C. Bartee, *Digital Computer Fundamentals,* TMH, Sixth Edition, 1991.

Reference Books
1. B. Ram, *Computer Fundamentals (Architecture and Organization),* New Age International Pvt. Ltd. Publishers, Third Edition.
2. Albert Paul Malvino and Donald. P Leach, *Digital principles and Applications*, TMH, Fourth Edition, 1991.

Subject Code : 17PDCA1C2	**Max. Marks : 100**
Hours : 6	**Internal Marks : 25**
Credits : 4	**External Marks: 75**

Objective
To impart the basic knowledge in the programming skills using C language and Object Oriented Concepts using C++.

UNIT I   **18 hours**
Overview of C: Introduction-Sample C program – Basic Structure of C Program – keywords and identifiers – constants – variables – data types- Operators: Arithmetic operators, Relational operators, Assignment operators, Increment and decrement operators, Conditional operators, #Bitwise operators# – Evaluation of expressions.

UNIT II   **18 hours**
Decision Making and looping: If statement – If…Else statement – Else..If ladder – Switch statement – While statement – For statement- Arrays: One dimensional arrays – Two dimensional arrays- Programs using control statements and arrays.

UNIT III   **18 hours**
Object Oriented Programming: Basic Concepts of Object Oriented Programming – Benefits of OOP – Applications of OOP – Structure of C++ Program –Functions:. Function Prototyping – Call by Reference – Return by Reference – Inline Functions – Default Arguments – Function Overloading -.#Built-in Functions# – Recursion.

UNIT IV   **18 hours**
 Classes and Objects: Specifying a Class – Defining Member Functions – Static Data Members – Static Member Functions –Objects as Function Arguments– Returning Objects – #Friend Functions# - Constructors - Parameterized Constructors – Copy Constructors – Destructor.

UNIT V   **18 hours**
Inheritance: Extending Classes – Defining Derived Classes – Single Inheritance – Multilevel Inheritance – Multiple Inheritance- Virtual Base class- Virtual Functions – Pure Virtual Functions-Formatted I/O statements. Working with Files: Classes for File Stream Operations – Opening and Closing a File –#File Opening Modes#.

#..........# - Self-Study Portion

Text Book

1. E. Balaguruswamy, *Programming in ANSI C*, TMH, Second Edition, 45th Reprint, 2001.
2. E. Balaguruswamy, *Object Oriented Programming with C++*, Tata McGraw Hill Education Private Ltd., New Delhi, Fourth Edition, 2008.

Reference Book

1. B.S. Gottfried- Programming with C- Schuams outline series, TMH, 1997 Edition.

Core III : Principles of Operating Systems

Subject Code : 17PDCA1C3 **Max. Marks   : 100**
Hours   : 6 **Internal Marks : 25**
Credits   : 4 **External Marks: 75**

Objectives
To Acquire a Thorough Knowledge in Memory Management, Processor Management, Device Management and Information Management of OS.

UNIT I
Introduction: Importance of Operating Systems – Operating System Resource Manager – Operating Systems-Hierarchical and extended Machine View – Other Views of an Operating System – General Design Considerations. I/O Programming: Types of I/O Channels – I/O Programming Concepts – I/O Processor Structure-360 & 370 –Communication Between CPU and Channel – I/O Example Using Single Buffering – I/O Example Using Double Buffering – Multiple card Buffering.

UNIT II

Interrupt Structure and Processing: Interrupt Types – Interrupt Mechanism – Interrupt Handlers.
Memory Management: Single Contiguous Allocation – Partitioned Allocation – Relocatable Partitioned Memory Management – Paged Memory Management – Demand-Paged Memory Management – Segmented Memory Management – Segmented Demand-Paged Memory Management

UNIT III
Processor Management: State Model – Job Scheduling – Process Scheduling – Synchronization – Multiprocessor Systems.

UNIT IV
Device Management: Techniques for Device Management – Device Characteristics – Channels and Control Units – Device Allocation considerations – Virtual Devices.

UNIT V
Information Management: A Simple File System – General Model – Symbolic File System – Basic File System – Logical File System – Physical File System.

Text Book
Stuart E.Madnick and John J. Donovan, *Operating Systems*, TMH, 14th Reprint, 2007.

Reference Books
1. B. Ram, *Computer Fundamentals (Architecture and Organization),* New Age
   International Pvt. Ltd. Publishers, Third Edition
2. Albert Paul Malvino and Donald P. Leach, Digital principles and Applications
   TMH, Fourth Edition, 1991.

SEMESTER - I
Core IV : Database Systems

Subject Code : 17PDCA1C4   **Max. Marks   : 100**
Hours   : 6   **Internal Marks : 25**
Credits   : 4   **External Marks: 75**

Objectives
To acquire a thorough knowledge in all the concepts of database systems.

UNIT I
RDBMS Concepts: Introduction – Database Approach – DBMS – Comparison of File System with DBMS – Data Models – Entity-Relationship Model – RDBMS – Keys – #Normalization # – Client Server Computing – Oracle Architecture

UNIT II
Beginning with SQL: Introduction – SQL Fundamentals – Data Types of SQL – Structure of Table – Table Creation Rules – Create Table – Creating Table from an Existing Table – Constraints to achieve Data Integrity –#Types of Constraints #– Display Information about Table – Altering Table – Removing Tables – Renaming Tables – Data Dictionary - DML Statement – Inserting, Updating, Deleting Records – Truncate Statement - Importance of TCL Statements

UNIT III
Simple Data Retrieval Statements: SQL*PLUS – Select Statement – Changing Column Heading with Column Aliases – Oracle Functions & Group by Clause : Introduction – Single Row Functions -# Aggregate Functions with Group by Clause #– Group Data

UNIT IV
Joins & Sub-queries: Types of Join – Nested Queries – View, Sequences and Indexes: Views – Sequences – Indexes – Managing of Users, Privileges and Roles: Database Users – Creating and Modifying Users – # Privileges #– Revoking an Object Privilege – Roles

UNIT V
Introduction to PL/SQL: Introduction – Advantages of PL/SQL – Architecture of PL/SQL – Structures of PL/SQL – PL/SQL Elements – Variables and Constants. Control Statement: Introduction – Conditional Control –Iterative Control – Sequential Control. Error Handling: Handling of Errors – Advantages of Exceptions –# Exception Types #– Cursor Handling: Introduction – Types of Cursor – Implicit Cursor Handling – Explicit Cursor Handling

 # .... # self-study portion.

Text Books
Parteek Bhatia, Sanjiv Datta, Ranjit Singh, *Simplified Approach to Oracle*, Third Revised Edition 2008. Kalyani Pulications
UNIT I – Chapter1: 1.1, 1.4, 1.5 – 1.10, 1.12. Chapter 2: 2.1, 2.2. Chapter 3: 3.4
UNIT II – Chapter 4: 4.1, 4.5, 4.6, Chapter5: 5.1 – 5.12 Chapter6: 6.2 – 6.6
UNIT III –Chapter7: 7.1 – 7.3. Chapter8: 8.1 - 8.4
UNIT IV – Chapter9: 9.1-9.3 Chapter10: 10.2 – 10.4 Chapter11: 11.1 – 11.5
UNIT V – Chapter16: 16.1, 16.3 – 16.6, Chapter17: 17.1 – 17.4, Chapter18: 18.2-18.4
          Chapter19: 19.1 – 19..3
Reference Books: Ivan Bayross, Commercial Application Development Using Oracle, 2nd Revised Edition, BPB Publications, 2013.
Rajeeb C. Chatterjee, Learning Oracle SQL and PL/SQL: A Simplified Guide, PHI Learning Private Limited, 2012.

Subject Code : 17PDCA1C5P1   **Max. Marks   : 50**
Hours   : 3   **Internal Marks : 12**
Credits   : 2   **External Marks: 38**

Programs using C :

1.   Finding biggest among three numbers using if statement

2.   Finding sum of individual digits of given number using while loop

3.   Sorting numbers in ascending order using for loop and array.

4   Matrix manipulations (Addition and Multiplication)

5.   Program to find the factorial of a given number using recursive function.

Programs using C++

6.   Program for swapping two numbers using function.

7.   Program using function that pass and receive objects.

8.   Program using constructors

9.   Programs using function overloading and friend function

10.   Programs using inheritance

11.   Programs using virtual function

12.   Program for mark sheet preparation using files

Subject Code : 17PDCA1C5P2   **Max. Marks   : 50**
Hours   : 3   **Internal Marks : 12**
Credits   : 2   **External Marks: 38**

MS-WORD
1. Prepare Bio-data using Text Manipulation.
2. Prepare a document in a newspaper format.
3. Table Creation.
4. Mail merge.

MS-EXCEL
1. Mark sheet Preparation
2. Data Sorting
3. Inventory Preparation
4. Pay bill Preparation
5. Drawing Graphs.

MS-POWERPOINT
1. Inserting Clip and Pictures.
2. Insertion of new slides
3. Slide Show.

Core VI : Internet and its Applications

Subject Code : 17PDCA2C6   **Max. Marks   : 100**
Hours   : 6   **Internal Marks : 25**
Credits   : 4   **External Marks: 75**

Objectives
To present the fundamental concepts of Internet, Internet Technologies.

UNIT I
Internet- An Introduction: Introduction-What's Special about the Internet? – You don't have to be a Mechanic to Drive a Car!-Internet Access/Dial-Up Connection – Internet Services Features-Getting Connected: Introduction – TCP/IP Vs shell accounts - Account details VSNL – Configuring the machine for the TCP/IP account – Configuring the shell account.

UNIT II
The World Wide Web (WWW):Introduction – Web Page – Net Surfing – Internet/Web Browsing: Introduction – Microsoft Internet Explorer – Viewers – Favorites – Netscape Navigator-Lynx.

UNIT III
Internet Addressing: What is Internet Addressing? – IP Address – Domain Name – Electronic Mail – Uniform Resource Locator (URL) – Internet Protocols**:** Introduction –Transmission Control Protocol/Internet Protocol (TCP/IP) – File Transfer Protocol (FTP).

UNIT IV
Hypertext Transfer Protocol (HTTP) – Telnet – Gopher – WAIS – Beyond Surfing –Searching the Web: Introduction – Web Index – Web Search Engine – Web Meta –Searcher.

UNIT V
Electronic Mail (E-Mail): Introduction – E-Mail Messages – Pine-Finding an E-Mail Address – Mailing Lists – Smileys – E-Mail Ethics (Netiquette) – E-Mail – Advantages and Disadvantages – Some Useful E-Mail Services – Creating Your Presence on the Web:Introduction.

Text Books
1. Internet for every one by Alexis Leon and Mathews Leon, Vikas publications House PVT LTD.

Subject Code : 17PDCA2C7   **Max. Marks   : 100**
Hours/Weeks : 6   **Internal Marks : 25**
Credits   : 4   **External Marks : 75**
Objective
To impart the features of object oriented concepts using Java programming language

UNIT I
Java History – Java Features –Java Support System-Java Environment – Java Tokens– Implementing a Java Program –JVM- Data Types –Operators-Expressions. Decision Making and Branching statements.

UNIT II
Classes, Objects and Methods – Defining a class-Creating Objects – Constructors -Method Overloading – Static Members – Inheritance: Extending a Class – Overriding Methods – Final Classes – Abstract Methods and Classes – Visibility Control.

UNIT III
Arrays, Strings and Vectors: Arrays, Strings and Utility Classes: One-dimensional Arrays – Creating an Array – Two-dimensional Arrays – String and StringBuffer classes – Vectors – #Wrapper Classes#. Interfaces: Defining Interfaces – Extending Interfaces – Implementing Interfaces – Accessing Interface Variables.

UNIT IV
Exception handling and Multithreaded Programming : Types of Errors – Exceptions – Syntax of Exception Handling Code – Multiple Catch Statements – Using Finally Statement – Throwing our own Exceptions – Creating Threads – Stopping and Blocking a Thread – Life Cycle of a Thread – #Using Thread Methods# – Thread Priority.

UNIT V
Applet Programming: How Applets differ from Applications – Building Applet Code – Applet Life Cycle – Creating an executable Applet – Applet Tag – Adding Applet to HTML File – Running the Applet – Passing Parameters to Applets – The Graphics Class.

 # .... # self-study portion.

Text Book

 1. E. Balagurusamy, *Programming With Java a Primer*, TMH, Fourth Edition, 2010.

Books for Reference

1. P. Radha Krishna, *Object Oriented Programming through Java*, University Press (India)

Core VIII : Visual Programming

Subject Code : 17PDCA2C8   **Max. Marks   : 100**
Hours   : 6   **Internal Marks : 25**
Credits   : 4   **External Marks: 75**

Objective
To provide fundamental concept of the Visual Basic language.

UNIT I
The Visual Basic Environment : The initial Visual Basic screen – The SDI Environment – Toolbars – The Toolbox – The initial form window – Project Explorer – Menu bar – Starting a new project – The properties window – common form properties – making a form responsive – saving the project.

UNIT II
Building the User Interface: Creating controls – The Name property – Anatomy of a Visual Basic Application – The code window – Statements in Visual Basic – Variables – Data types – Working with variables – constants – Determinate Loops – Indeterminate Loops – Making Decisions – Select Case – Nested If.

UNIT III
Built-In Functions: String Functions – Numeric Function – Financial Function – Function Procedures – Sub Procedures – Passing by Reference – Passing by Value – Subprograms – Arrays – Fixed Vs Dynamic Arrays – Static Arrays – Assigning Arrays – Arrays with more than one dimension- Control Arrays.

UNIT IV
Windows Common Controls: Common Dialog Boxes – Rich Text Box – Image list control – List View control – Progress Bar Control - Slider control – Status Bar Control – Tab Strip Control – Tool Bar Control - Tree View Control – File System Controls – Menu Editor – MDI Forms.

UNIT V
Database Development: Using the Data Control – Methods and Events for the Data Control – Monitoring changes to the Database – The Data Form Wizard – ActiveX Controls – Testing the control – Adding the functionality – The life cycle of a control.

Text Book
1. Gary Cornell, *Visual Basic 6 from the Ground Up*, Tata McGraw Hill Edition.

Subject Code : 17PDCA2C9   **Max. Marks   : 100**
Hours   : 6   **Internal Marks : 25**
Credits   : 4   **External Marks: 75**

Objective
To learn the basic concepts of web design. The course gives a basic idea of designing a web page using HTML. At the end of the programme the students will be able to design some static web pages.

UNIT I
Introduction to the Internet : Electronic mail – Resource Sharingr – Remote Login – World Wide Web – Search Engine – Browsers – Introduction to static , dynamic and active web pages. Introduction to HTML: Designing a Home page-History of HTML-HTML Generations-HTML Documents-Anchor Tag-Hyper links-Sample HTML documents.

UNIT II
Head and Body Sections : Header Section-Title-Prologue-Links-Colorful Web page- Comments Lines. Designing the Body Section: Heading - Printing-Aligning the Headings-Horizontal Rule-Paragraph-Tab Settings-Images and Pictures-Embedding PNG Format Images.

UNIT III
Ordered and Un Ordered Lists: Lists-UnOrdered Lists-Headings in a List-Ordered Lists-Nested Lists. Table Handling: Tables-Tables creation in HTML-width of the Table and Cells-Cells Spanning Multiple Rows/Columns-Coloring Cells-Column Specification

UNIT IV
DHTML and Style Sheets: Defining Styles-Elements of Styles- Linking a Style Sheet to an HTML Documents-In line Styles-Inernal and External Style Sheets-Multiple Styles Frames:Frameset Definition-Frame Definition-Nested Framesets.

UNIT V
Forms:Action Attribute-Method Attribute-Enctype Attribute-Drop down list-Check Boxes-Radio Buttons-Text Field-Text area-Password and Hidden Fields-Submit and Reset Buttons-Designing Sample Forms.

Text Book
1. C XAVIER, *World Wide Web design with HTML*- Tata McGraw Hill Publishing
   Company Limited 2001. ISBN 0-07-463971-4.

Subject Code : 14PDCA2C10P1   **Max. Marks   : 50**
Hours/Weeks : 3   **Internal Marks : 12**
Credits   : 2   **External Marks : 38**

1. Program for accepting inputs through various ways.

2. Program using operators and expressions

3. Programs using control statements

4. Program using class and objects

5. Program for method overriding

6. Program to demonstrate methods in the String and StringBuffer classes.

7. Program for manipulating Vector class.

8. Program to implement single and multiple inheritances

9. Program for multi-threading using Runnable interface.

10. Program to handle Exceptions.

11. Write an Applet program

     a) to display a message.

     b) for passing parameters.

12. Program to display geometrical objects on a window

Subject Code : 17PDCA2C10P2   **Max. Marks   : 50**
Hours   : 3   **Internal Marks : 12**
Credits   : 2   **External Marks: 38**

1.   Developing a standard tools(Arithmetic Operations)

2.   Developing a Simple Calculator

3.   Image Manipulation

4.   Design a Menu Tree

5.   Employee Information System

6.   Pay Bill preparation

7.   Student Mark Sheet Processing

8.   Simple Banking Transaction

9.   Develop a Text Editor using Common Dialog Box

10.   Develop a Text Editor without using Common Dialog Box