Annexure - 15

PERIYAR UNIVERSITY SALEM 638 011

PERIYAR INSTITUTE OF DISTANCE EDUCATIONS (PRIDE)



P.G. DIPLOMA IN COMPUTER APPLICATIONS

PGDCA

NON-SEMESTER

REGULATIONS AND SYLLABUS

(Effective from the academic year 2008-2009 and thereafter)

P.G. DIPLOMA IN COMPUTER APPLICATIONS

REGULATIONS

Effective from the Academic year 2006 – 2007 and thereafter

1. CONDITION FOR ADMISSION:

A candidate who has passed any degree of this University or any of the degree of any other University accepted by the syndicate as equivalent thereto subject to such conditions as may be prescribed therefore shall be permitted to appear and qualify for the **Post Graduate Diploma in Computer Applications (PGDCA)** degree examination of this University after a course of study of ONE academic years

2. DURATION OF THE COURSE:

The course for the Post Graduate Diploma in Computer Applications shall consist of one academic year.

3. ELIGIBILITY FOR THE P.G. DIPLOMA:

A candidate shall be eligible for the P.G. Diploma in Computer Applications if he/she has satisfactorily undergone the prescribed course of study for a period of not less than one year and passed the examinations in all the papers.

4. COURSE OF STUDY:

The course of study shall comprise instruction in the following subjects according to the syllabus and books prescribed from time to time.

- 1. Computer Organization
- 2. C and Data Structures
- 3. C++ Programming
- 4. Operating Systems
- 5. Database Management Systems
- 6. Internet and Java Programming
- 7. Visual Programming
- 8. Computer Oriented Numerical Methods
- 9. Practical I: C Programming (Numerical Methods)
- 10.Practical II: C++ and JAVA Programming Lab
- 11.Practical III: Visual Programming Lab

5. EXAMINATIONS:

The examination shall be three hours duration to each paper at the end of the year. The candidate failing in any subject(s) will be permitted to appear for each failed subject(s) in the subsequent examination. Practical Examination should be conducted at the end of the year.

6. SCHEME OF EXAMINATIONS:

The Schem	e of Examination	s shall be as	s follows:
		5 bilaii 00 ac	, 10110

Sl. No.	Paper Title of the Paper Code	Exam Duration	Maximum Marks
1.	Computer Organisation	3	100
2.	C and Data Structures	3	100
3.	C++ Programming	3	100
4.	Operating Systems	3	100
5.	Database Management Syst	ems 3	100
6.	Internet and Java Programm	ning 3	100
7.	Visual Programming	3	100
8.	Computer Oriented Numeri Methods	cal 3	100
9.	Practical I: C Programming (Numerical Methods)	3	100
10.	Practical II: C++ and JAVA Programming	3	100
11.	Practical III: Visual Program	nming 3	100
	Total marks		1100

7. QUESTION PAPER PATTERN

a. For Theory

Time: 3 Hours

Max. Marks :100

PART - A : 5 X 5 = 25

(Answer all Questions)

(Two Questions from each unit with Internal Choice)

PART – B : 5 X 15 = 75

(Answer all Questions)

(Two Questions from each unit with Internal Choice)

b. For Practical

Time: 3 Hours

Max. Marks :100

One / Two Compulsory Problem(s) to be solved within 3 hours.

c. Distribution of the marks

/• \	D 1 1	
(1)	Practical	٠
(1)	Tractical	٠

 For Writing procedures/programs in the main answer book 40%
For listing and debugging 40%
For correct and formatted output 20%

8. PASSING MINIMUM:

A candidate shall be declared to have passed the examination in a theory/practical of study only if he/she scores not less than 50 marks out of 100 in the University Examination.

9. CLASSIFICATION OF SUCCESSFUL CANDIDATES:

Candidates who secure not less than 60% of the aggregate marks in the whole examination shall be declared to have passed the examination in **First Class**. All other successful candidates shall be declared to have passed in **Second Class**. Candidates who obtain 75% of the marks in the aggregate shall be deemed to have passed the examination in **First Class with Distinction** provided they pass all the examinations prescribed for the course at the first appearance.

1. COMPUTER ORGANIZATION

UNIT I

Introduction to computers – Classification – Number systems – Boolean Algebra – Gates. Logic design : Flip-flops – Transfer circuits Clocks – Shift registers – Counters.

UNIT II

Design and implementation of Binary Adders and Subtractors – BCD Adder – Multiplexer – Demultiplexer – Encoder – Decoder – Floating point number systems.

UNIT III

Instruction codes – Computer registers – Computer instructions – Timing and control – Instruction cycle – Memory reference instructions – Input output and Interrupt.

UNIT IV

Programming the Basic Computer: Introduction – Machine language – Assembly language – Assembler – Program loops – Programming Arithmetic and Logic operations – Subroutines – Input/Output programming.

UNIT V

Central Processing Unit: Introduction – General Register Organisation – Stack Organisation – Instruction formats – Addressing modes.

TEXT BOOKS:

- Digital Computer Fundamentals Thomas C. Bartee., T.M.H., New Delhi, 6th edition. (Units I and II)
- Computer System Architecture M. Morris Mano, PHI, 3rd edition. (Units III, IV and V)

REFERENCE BOOKS:

- 1. Computer Organization and Architecture J.P. Hayes, TMH, 2nd edition.
- Computer Organization and Architecture Designing for Performance William Stallings, Pearson Education, 6th edition.
- Fundamentals of Computer Science and Communication Engineering Alexis Leon, Mathews Leon.

2. C AND DATA STRUCTURES

UNIT I

Programming language C – Constants, variables and data types – Operators and Expressions – I/O operators – IF, IF-THEN-ELSE, GOTO, SWITCH statements – Looping.

UNIT II

Structures and Unions – Arrays and string handling functions – pointers. Files – opening/closing a file – file I/O – error handling during I/O operations – Random access files – command line arguments.

UNIT III

Data Structures: Introduction – Arrays – Structure – Representation of arrays – Fundamentals of Stack and Queues – Operations on Stack and Queues – Evaluation of expressions – Circular Queues.

UNIT IV

Linked list operations: Linked stacks and Queues – Polynomial addition – Circular lists – Doubly linked lists – Operation on Doubly linked list.

UNIT V

Trees and Graphs: Binary trees – Conversion – Forest to Binary tree – Tree traversals. Graph: Definition – Types – Graphs traversal – Shortest path (Dijikstra's algorithm)

TEXT BOOKS:

- 1. Programming in C E. Balagurusamy, TMH, 3^{rd} edition.
- 2. Fundamentals of Data Structures Horowitz E. and Sahini, Galgotia publications.

- 1. Programming with C Byron S. Gootfried, TMH, 2^{nd} edition.
- 2. Programming with C T. Jeyapoovan, Vikas publications.
- 3. Data Structures Schaum's outline series, TMH.
- 4. Data Structures through C Yashavant Kanetkar, BPB publications.

3. C++ PROGRAMMING

UNIT I

Beginning with C++ : What is C++ - Applications of C++ - Structure of C++ Program – A simple C++ Program – More C++ statements – An example with class. Tokens, Expressions and Control Structures: Introduction – Tokens, Keywords – Identifieers and Constants – Basic data types – User-defined data types – Derived data types – Symbolic constants – Type compatibility – Declaration of variables – Dynamic Initialization of Variables – Reference variables.

UNIT II

Operators in C++ - Scope resolution operator – Member dereferencing operators – Memory management operators – Manipulators –Type cast Operators – Expressions and their types – Special Assignment expressions – Implicit conversions – Operator overloading – Operator precedence – Control structures. Functions in C++: Introduction – The Main function – Function prototyping – Call be reference – Return by reference – Inline functions – Default arguments – Const Arguments – Function overloading – Friend and Virtual functions.

UNIT III

Classes and Objects: Specifying a class – Defining member functions – A C++ program with class – Making an outside function inline – Nesting of member functions – Private member functions – Arrays within a class – Memory allocation for objects – Static data members – Static member functions – Arrays of objects – Objects as function arguments – Friend functions – Returning objects – Const member functions – Pointers to member – Local classes. Constructors and Destructors: Constructors – Parametrized Constructors – Multiple Constructors in a class – Constructors with Default arguments – Dynamic initialization of objects – Copy constructor – Dynamic Constructors – Destructors.

UNIT IV

Operator overloading and type conversions: Defining operator overloading – Overloading unary operators – Overloading binary operators – Using friends – Manipulation of strings using operators – Inheritance Extending classes – Defined derived classes – Single Inheritance – Multiple inheritance – Hybrid inheritance – Virtual base classes – Abstract classes – Constructors in derived classes – Member classes – Nesting of classes – Pointers – Virtual functions – Polymorphism.

UNIT V

Managing console I/O operations: C++ streams – C++ stream classes – Formatted and Unformatted console I/O operations – Managing output with manipulators. Working with files: Classes for file stream operations – Opening and closing a file – File modes – File pointers – Updating a file: Random access – Command – line arguments – Templates – Exception handling.

TEXT BOOK:

1. Object-oriented programming with C++ - E. Balagurusamy, TMH, 2nd edition.

- 1. Programming with C++ Ravichandran, TMH, 1996.
- The C++ Programming Language Bjarne Stroustrup, Addision Wesley, 2004.

4. OPERATING SYSTEMS

UNIT I

Evolution of Operating systems – Type of operating system – Different views of OS – Design and implementation of Operating System – I/O Programming concepts – Interrupt Structure and Processing.

UNIT II

Memory Management: Single Contiguous Allocation – Partitioned Allocation – Relocatable Partitioned Allocation- Paged and Demand Paged Memory Management – Segmented Memory Management – Segmented and Demand Paged Memory Management – Swapping and Overlay Techniques.

UNIT III

Processor Management: Job Scheduling – Process Scheduling – Functions and Policies – Evaluation of Round Robin Multiprogramming Performance – Process Synchronization – Race condition – Synchronization mechanism – Deadly embrace prevention and detection and recovery methods.

UNIT IV

Device Management: Techniques for device management – Device characteristics – I/O Traffic controller – I/O Schedule – I/O Device handlers – Virtual devices – Spooling.

UNIT V

File Management: Simple file system – General model of a file system – Physical and logical file systems.

Case Studies : DOS, Windows, UNIX / LINUX Operating systems.

TEXT BOOK:

1. Operating systems – E. Madnick and John J. Donovan, TMH.

- 1. Operating system concepts and design Milan Milenkovic, TMH.
- Operating System Concepts Petersons and Silberscharz, Addison Wesley publishing company, 3rd edn.

5. DATABASE MANAGEMENT SYSTEMS

UNIT I

An overview of Database Management – Introduction – Definition of Database system – Data Independence – Relational systems – Database system Architecture – Three levels of Architecture – Database Administrator – Client Server Architecture – Distributed processing.

UNIT II

Relational databases – Introduction – Relational Model – Relations and Relational Variables – Optimization Transactions – An introduction to SQL – Embedded SQL – Domains, Relations and Base Relations.

UNIT III

Relational agent – Introduction – Syntax – Semantics – Examples – Additional operators – Relational calculus – Tuple calculus – Examples – Calculus Vs Algebra – Domain calculus – SQL Specialities.

UNIT IV

Database design – Functional Dependencies – Introduction – Basic definitions – Normalization – First, Second, Third Normal Forms – BOYCE CODD Normal Form.

UNIT V

Transaction Management – Recover – Introduction – Transactions – Transaction Recovery – System Recovery – Media Recovery – Concurrency – Three Concurrency Problem – Locking – Deadlock – Survivability.

TEXT BOOK:

1. An Introduction to Database systems – C.J. Date –Addison Wesley Publication, 7th edition.

- Database system concepts, Abraham Silberscharz, Henry F. Korth and S. Sudarsan, TMH ,3rd edition.
- 2. Database Management systems Alexis Leon, Mathews Leon, Vikas Publications.

6. INTERNET AND JAVA PROGRAMMING

UNIT I

Internet connection concepts – Intranets: Connecting LANs to the Internet – E-Mail concepts – E-Mail security. Reasons to secure the messages - Public key cryptography. Using cryptography with E-Mail – Online chatting and Conferencing concepts – WWW concepts.

UNIT II

Fundamentals of Object Oriented Programming – JAVA evolution – Overview of JAVA language – Constants, Variables and Data types – Operators and Expressions – Decision making.

UNIT III

Classes, Objects and Methods – Arrays, String and Vectors – Multiple Inheritance.

UNIT IV

Packages - Multithreaded programming - Managing errors and exceptions.

UNIT V

Applet programming – Graphics programming – Managing Input/Output files.

TEXT BOOKS:

- 1. The complete reference Internet Millenium Edn, Margaret Levine Young, TMH.
- 2. Programming with JAVA E. Balagurusamy, TMH, 2nd edition.

- 1. The Internet Complete reference Harley Hahn, TMH, 2nd edition.
- 2. Programming with JAVA2 C. Xavier, Scitech publications.
- The complete reference JAVA2 Patrick Naughton and Herbert Schildt, TMH, 3rd edition.

7. VISUAL PROGRAMMING

UNIT I

Windows Programming: GUI concept – Hungarian notation – Data types- Handles – Message driven architecture – Message Processing & Loop, GDI – Brush, pen, font, cursor, menu, keyboard & mouse handling – Displaying test & graphics – Dialog boxes controls – Winmain procedure – Files, clipboard, printer handling – DDE – DLLs, OLE, COM, ODBC-Windows registry – New executable [NE] and Portable Executable [PE] files.

UNIT II

Introduction to Visual Basic - Variables, constants, strings –Data Types – Tools and Techniques.

UNIT III

Organizing information via code – Arrays - Organizing information via Controls – Control Arrays – List and Combo Boxes – Flex Grid Control – Building Large Projects – Navigating Among Forms

UNIT IV

Working with Interface – Microsoft Windows common Controls 6.0 – Menus – MDI Forms. DDE Properties – DDE Events – DDE Methods – OLE properties – Active X Controls Creation & image – Database Access – Data control – Field Control – Data grid – Record set using SQL to manipulate data.

UNIT V

Introduction to Graphics – Fundamentals of Graphics – Screen Scalar – Line and Shape controls – Graphics via code – Lines and Boxes – Circles – Ellipse and Charts. Basic File Handling – Building your own Active X controls

TEXT BOOKS:

1. Programming windows - Charles Petzold, Microsoft Corporation, 5th edition, 1999.

2. Visual Basic 6 from the Ground up - Garry Cornel,", Tata McGraw-Hill, 2005.

- 1. Programming with Visual Basic Mohammed Azam , Vikas Publishing house Pvt Ltd.
- 2. Visual Basic 6.0 Programming Steven Holzner, DreamTech Press, 2003.

8. COMPUTER ORIENTED NUMERICAL METHODS

UNIT I

Calculus of Finite Differences – Introduction – Fundamental theorem of Difference calculus – Difference operator and Sifting operator - Interpolation with equal intervals – Newton's Interpolation formula (Forward and Backward)

UNIT II

Interpolation with Unequal intervals – Introduction - Divided differences – Newton's formula for unequal intervals – Lagrange's Interpolation formula – Central Difference Interpolation formulae – Gauss Interpolation formulae – Stiriling's formula.

UNIT III

Solution of Algebraic and Transcedental Equations – Introduction - Regula Falsi method – Bisection method – Iteration method – Newton-Raphson method – Simultaneous equation – Gauss Elimination method – Gauss-Jordan method – Gauss-Seidal method.

UNIT IV

Numerical Differentiation and Numerical Integration – Derivatives using Newton's Forward, Newton's Backward and Stiriling's formula. Numerical Integration – General Quadrature formulae – Trapezoidal rule – Simpson's One-Third rule – Simpson's Three Eight rules.

UNIT V

Numerical Solutions of Ordinary Differential First and Second order equations – Introduction - Taylor's series method – Euler's method – Modified Euler's method - Runge-Kutta methods.

TEXT BOOKS:

- Numerical methods for Scientific and Engineering Computation M.K. Jain, S.R.K. Iyengar and R.K.Jain, New Age International Pvt. Ltd.
- 2. Computer Oriented Numerical Methods Raja Raman.

REFERENCE BOOKS:

 Numerical methods for Science & Engineering – M.K. Venkataraman, 5th edition, 1997.

9. PRACTICAL I C PROGRAMMING LAB

Implement the following in C:

- 1. Lagrange's Interpolation formula
- 2. Regula Falsi method
- 3. Bisection method
- 4. Newton-Raphson method
- 5. Gauss Elimination method
- 6. Gauss-Jordan method
- 7. Gauss-Seidal method.
- 8. Trapezoidal rule
- 9. Simpson's One-Third rule and Simpson's Three Eight rules.
- 10. Taylor's series method
- 11. Euler's method
- 12. Runge-Kutta method

10. PRACTICAL II C++ AND JAVA PROGRAMMING LAB

C++:

- 1. Matrix Manipulation (Addition, Subtraction, Multiplication and Transpose)
- 2. Implement Push, Pop operations of a Stack using (i) Arrays (ii) Pointers.
- 3. Implement Add. Delete operations of a Queue using (i) Arrays (ii) Pointers.
- 4. To convert an Infix Expression to Postfix Expression using Arrays.
- 5. To add two Polynomials using pointers.
- 6. To create a Doubly Linked List and to insert or delete an element from Doubly linked list.
- 7. All tree traversals for a Binary Tree using Arrays.
- 8. Implement Dijkstra's algorithm to find the shortest path between given source and destination path of a graph.

JAVA:

- 1. Program to create a simple applet and application.
- 2. Using Java classes and objects.
- 3. Using Java Inheritance and Interface.
- 4. Using Arrays in Java.
- 5. Using Exceptions.
- 6. Using Threads and Multithreads.
- 7. Using AWT Package.
- 8. Using I/O Package.

11. PRACTICAL III

VISUAL PROGRAMMING

VISUAL BASIC:

- 1. Simple exercise using standard controls.
- 2. To design a calendar of any year.
- 3. To scroll your college name from left to right and right to left of the Client area.
- 4. To design and implement a calculator.
- 5. To expand a shrinking object while the program is running.
- 6. To create animation by using Move method and Timer object.

Note:

*Each Package should contain atleast 3 Forms and 2 Reports.

*Include appropriate validations wherever necessary.

*Validate with at least 5 records.

*Prepare summarized and Query based Report.

- 7. Student Information System.
- 8. Stock Management System.
- 9.. Reservation System for any one of the following

(i).Bus,(ii)Airline,(iii)Railways.

10. Employee Information System.