PONDICHERRY UNIVERSITY

RAMANUJAN SCHOOL OF MATHEMATICS AND COMPUTER SCIENCE

DEPARTMENT OF COMPUTER SCIENCE

CURRICULUM

FOR

POST GRADUATE DIPLOMA
IN
COMPUTER APPLICATION

(Effective from the academic year 2009-2010)

PONDICHERRY UNIVERSITY
POST GRADUATE DIPLOMA IN COMPUTER APPLICATION
REGULATIONS
(Effective from the academic year 2009-2010)

Aim of the Course

The Post Graduate Diploma in Computer Application (PGDCA) aims to introduce the students to the Computer applications. At the end of the course, the students are expected to have good working knowledge in Computer Systems and Applications.

Eligibility for Admission

Candidates for admission to PGDCA shall be required to Bachelor's degree with a minimum of 45% marks with Computer Science/Mathematics/Statistics/Business Mathematics as one of the subjects of study or an examination accepted as equivalent thereto, subject to such conditions as may be prescribed therefore.

Duration of the Course

The course shall be of one year duration spread over two semesters. The maximum duration to complete the course shall be 2 years.

Medium

The medium of instruction shall be English.

Passing Minimum

The candidates should get minimum of 40% in internal and in external examinations.

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CURRICULUM

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FIRST SEMESTER PGDCA

Code	Paper	Credit	Lect.	Pract.	Total Hours per Semester	Int.	Ext.	Max. Marks
101	Data Structures using C++	3	2	1	48	40	60	100
102	Basics of Information Technology	2	2	-	32	40	60	100
103	Operating System	3	2	1	48	40	60	100
104	Object Oriented Programming	2	2	-	32	40	60	100

SECOND SEMESTER PGDCA

Code	Paper	Credit	Lect.	Pract.	Total Hours per Semester	Int.	Ext.	Max. Marks
201	Data Base Management System	2	2	-	32	40	60	100
202	Computer Networks	2	2	-	32	40	60	100
203	Web Technology	3	2	1	48	40	60	100
204	Software Engineering	3	2	1	48	40	60	100

PGDCA 101 : DATA STRUCTURES USING C++

UNIT I

Introduction –creation and analysis of programs – ADT: Ordered lists- Sparse Matrices – Stacks - Queues.

UNIT II

A maze problem – Evaluation of Expressions – Multiple Stack and Queues – Linked Lists – Single Linked Lists – Linked Stacks and Queues – Polynomial Addition.

UNIT III

More on Linked Lists – Double Linked Lists – Dynamic storage Management garbage collection and compaction

UNIT IV

Trees – basic terminology – Binary Trees – Binary tree representations – Binary Tree traversal – Threaded Binary Trees – Applications of Trees.

UNIT V

Graphs – Terminology and Representations- Traversals- Shortest path- Connected Components – Networking Activity - Critical Paths.

TEXT BOOK

Ellis Horowitz and Sartaj Sahni , " Fundamentals of Data Structures ", Galgotia Book Source – New Delhi.

REFERENCE

Bhagat Singh And Thomas L.Nayos , "Introduction to Data Structure", Galgotia Book Source

PGDCA 102 : BASICS OF INFORMATION TECHNOLOGY

Unit I

Introduction to IT – Data Vs Information – Components of Information Technology – Applications of Information Technology in various domains – Introduction to various information systems.

Unit II

Hardware: Various types of computers – Input devices – storage devices – output devices. Software : Languages – packages – operating systems – Introduction to open source.

Unit III

Computer Networks : Benefits – Types of networks – Networking Components – Network Topology – Introduction to network protocols.

Unit IV

Evolution of internet - Internet Vs WWW – IP addresses – Domain Name Systems - Web browsers – static and dynamic web pages - e-mails – web search engines.

Unit V

Security : Needs for security – Types of threats – detection and prevention - methods – components – back up and recovery – recent trends in information security.

Text Books:

1. Brain, K. Williams, et. al., *Using Information Technology*, Third edition, TMH.
2. Turban, Rainer, Potter, *Introduction to Information Technology*, second edition, Wiley Publications.
3. Dennis P. Curtin, et.al., *Information Technology - The Breaking View*, TMH.

PGDCA 103 : OPERATING SYSTEMS

Unit I

Operating Systems – Introduction – Basic Concepts and terminology –OS Resource Manager – OS process view point – OS hierarchical and extended machine view – Memory management: Single contiguous memory allocation – Introduction to multiprogramming – Partitioned memory management.

Unit II

Memory management: Relocatable partitioned memory management – Paged memory management – Demand paged memory management – Segmented memory management – Segmented and Demand – Paged memory management – Swapping and Overlays.

Unit III

Processor management – State model – Job scheduling - Process scheduling – Multi Process system – Process Synchronization.

Unit IV

Device Management: Techniques for Device Management – Device Characteristics – Channels and Control Unit – Device Allocation – I/O Controller, Scheduler, Device Handler- Virtual Devices

Unit V

Information Management : A simple file system- General Model of a File System – Symbolic File System – Basic File System – Access Control Verification – Logical file system – Physical file system – Allocation strategy module.

Text Book

Avi Silberschatz, Peter Baer Galvin & Greg Gagne , "Operating Systems Concepts"

Reference

1.Andrew S. Tanenbaum, "Operating Systems - Design and Implementation".
Maurice J. Bach, "The Design of the Unix Operating System , PHI

PGDCA 104 : OBJECT ORIENTED PROGRAMMING

UNIT I

Introduction to Object Oriented Programming (OOP), C++ programming basic, Loops and decisions: Relational operators, loops, decision, logical operators, precedence.

UNIT II

Structures, enumerated data types. Function: simple functions, passing argument to functions, returning values from functions, reference arguments, overloaded functions, inline functions, variable and storage classes.

UNIT III

Objects and classes: Classes and Objects, Specifying the class, using the class, constructors, destructors, object as function arguments, returning object from function. Arrays: Arrays fundamentals, Array a Class member data, Array of objects, Strings. Operator overloading: unary operator, overloading binary operators, Data conversion.

UNIT IV

Inheritance: Derived Base class, derived class constructors, overloading member functions, class hierarchies, public and private inheritance, levels of inheritance multiple inheritance. Pointers: Address and pointers, pointers and arrays, pointers and functions, pointers and strings, Memory management, pointer to objects.

UNIT V

Virtual functions and other functions: Virtual functions, Friend functions, Static functions, this pointer. Files and Stream: String I/O, Object I/O with multiple objects, file pointer, disk I/O with member functions.

TEXT BOOK

Robert Lafore , " Object – Oriented Programming C++ " , Galgotia Pub.

REFERENCE

Stephen Parta , " C++ Primer Plus " , Galgotia Pub.
E.Balagurusamy , Object Oriented Programming with C++"

PGDCA 201 : DATABASE MANAGEMENT SYSTEMS

UNIT I

Introduction to Database Systems: Overview – Data Models – Database System Architecture – History of Database Systems. Entity-Relationship Model: Basic Concepts – Constraints – Keys – Design Issues – Entity Relationship Diagram – Weak Entity Sets – Design of an E-R Database Schema

UNIT II

Integrity and Security: Domain Constraints – Referential Integrity – Assertions – Triggers – Security and Authorization – Authorization in SQL – Encryption and Authentication.

UNIT – III

Relational-Database Design: First Normal Form – Second normal form- Boyce-Codd Normal Form – Third Normal Form – Fourth Normal Form.

UNIT – IV

Storage and File Structures: Overview of Physical Storage Media – Magnetic Disks – RAID – Tertiary Storage – Storage Access – File Organization – Organization of Records in Files

UNIT – V

Data-Dictionary Storage. Indexing and Hashing: Basic Concepts – Ordered Indices – B^+-Tree Index Files – B-Tree Index Files – Static Hashing – Dynamic Hashing Index Definition in SQL – Multiple-Key Access

TEXT BOOK

1. Silberschatz, Korth, Sudarshan, "*Database System Concepts*", 4th Edition – McGraw-Hill Higher Education, International Edition 2002. Chapters: 1 to 7, 11, 12, 15 to 17.

REFERENCES

1. Fred R McFadden, Jeffery A Hoffer, Mary B. Prescott, "Moden Database Management:, Fifth Edition, Addison Wesley, 2000.
2.Elmasri, Navathe, "Fundamentals of database Systems", Third Edition, Addison Wesley, 2000.
3.Jefrey D.Ulman, Jenifer Widom, "A First Course in Database Systems:, Pearson Education Asia, 2001.
4.Bipin C Desai, "An Introduction to Database Systems", Galgotia Publications Pvt Limited, 2001.

PGDCA 202 : COMPUTER NETWORKS

Unit I

Introduction to networks -Network Topology - Network Architecture - OSI reference models - Example networks - Internet – Ethernet - Analog and Digital signals – Modems -A/D Conversions.

Unit II

Physical Layer - Transmission media - Wireless Transmission - the telephone system - ISDN - Narrowband ISDN - Broadband ISDN - Communication Satellite

Data Link Layer - Error Correction and Detection - Elementary and Sliding window Protocols.

Unit III

Network Layer - Network layer Design issues - Routing Algorithms - Congestion Control, Internetworking - Network layer in Internet.

Transport Layer - Transport Service - Elements of Transport protocols - Simple Transport Protocol - Internet Transport Protocol (TCP & UDP).

Unit IV

Application Layer - DNS - E-mail - World Wide Web – Multimedia - Introduction to Digital Audio – Audio Compression – Voice Over IP – Introduction to Video – Video Compression

Unit V

Network Security – Cryptography – Symmetric-Key Algorithms – Public-Key Algorithms – Digital Signatures – Authentication Protocol.

Text Books

1.Andrew. S. Tanenbaum, "Computer Networks", 4th Edition, PHI
2.Comer, "Internetworking with TCP/IP - Principles, Protocol and Architecture", 3rd Edition, PHI.

References

1.Black, "Computer Networks - Protocols, Standard, Interface", 2nd Edition, Prentice Hall of India.1
2.Douglas E. Comer, "Computer Networks and Internets", 2nd Edition, Pearson Education Asia.
3.B. Forouzan, "Data Communication and Networking", McGraw Hill Editions, 1998.
4.Thomas C Bartee, "Data Communications, Networks and Systems", 3rd Edition, 1985.

PGDCA 203 : WEB TECHNOLOGY

Unit – I

Introduction to Internet – Resources of Internet – H/w & S/w requirements of Internet – Internet Service Providers – Internet Services – Protocols – Concepts – Internet Clients and Internet Servers

Unit – II

Introduction to HTML – Function of HTML in Web Publishing – Basic Structural Elements and their usage – Traditional text and formatting – Style sheets formatting – Using tables for organization and layout – Advanced layout and positioning with style sheets – forms – Frames and frame sets – Plug-ins with HTML – Using the HTML object model and creating dynamic HTML pages – manipulating objects and responding to user interactions – Saving using preferences – Cookies and OPS - **Scripting basics** – Introducing Java Script – Creating simple Java Scripts – Using Java Scripts for Forms – Using Java Scripts with Style sheets.

Unit – III

Introduction to Java Programming – JVM – Applet Programming – Java Beans – JARS and Safe Computing – Java Network Programming – Serialization and RMI – JDBC

Unit – IV

Serverside Scripting - Introduction to CGI and other serverside scripting languages – Introduction to ASP (Active Server Objects) – **Java Servlet** - Introduction- Servlet Security – Servlet Structure – Life cycle of Servlet – Session maintenace with Servlet - **JSP(Java Server Pages)** – Benefits - JSP Directives – Actions – Declarations – Scriptlets – Expressions – JSP & ASP comparison

Unit – V

Recent trends: Introduction to J2EE Technology – Introduction to Enterprise JavaBeans (EJB) - Session Beans – Enterprise Beans - XML – DOM – SAX – XML parsers (DOM & SAX based)

Text Books:

1. Web Publishing with HTML4, Laure Lemay, Techmedia, First Edition
2. Java Database programming, Martin Rinchart, Tata McGrawHill, Second Edition,2000
3. Java Tutorial, Campione, Walmath, Huml, Addison Wesley, Second Edition, 2000
4. ASP in 21days, Micheal Alkinson, Techmedia, First Edition, 2000
5. VBScript Interactive course, Simon, Techmedia, First Edition, 1999
6. “Commercial Web Development ”, Ivan Bayross.
7. XML – how to program by Deitel and Deitel, Pearson Education,2001
8. J2EE Best Practices by Darran Broaemer, Wiley, 2003
9.J2EE Tutorials by Stephenic Bodoff, PHI, 2002
10. JSP, The complete reference by Hamma, Tata McGrawHill, 2001.
11. Instant Javascript by Webb, TataMcGrawHill, 2001

PGDCA 204 : SOFTWARE ENGINEERING

Unit I

Introduction, Software process, Software Process Models, Linear Sequential Model, Prototype Model, RAD Model, Evolutionary Software Process Model, Analysis concepts and principles, Analysis modelling.

Unit II

Software process and Project Metrics, Risk Management, Quality Assurance and Configuration management.

Unit III

Software Design, Design Principles, Design concepts, Architectural Design, Procedural Design, Design of Real-time systems.

Unit IV

Software Testing, Test-case Design, White Box Testing, Black Box testing, Testing GUI and Client/ Server Architecture, Testing Strategies, Unit Testing, Integration testing, Validation testing, System testing, Software Maintenance.

Unit V

Recent trends in Software Engineering, Clean room Software Engineering, Re-engineering, Client/ Server Software Engineering.

Text Book

1.Roger S. Pressman, “Software Engineering a Practioner’s Approach”, McGramHill, Fourth Edition

References

1.Ian Somerville, “Software Engineering”, Addision Wesley
2.Richard Fairley, “Software Engineering concepts”, TataMsGram Hil
3.Pankaj Jalote, “An Integrated approach to Software Engineering”, Galgotia