



BHARATHIDASAN UNIVERSITY TIRUCHIRAPPALLI  
M.Sc., Computer Science (Non Semester)

(Candidates admitted from the year 2015 onwards under Distance Education mode)

Year	Paper	Title of the Paper	Exam Hours	Marks
I	Paper – I	OOAD and UML	3	100
	Paper – II	Advanced Java Programming	3	100
	Paper – III	Compiler Design	3	100
	Paper – IV	Microprocessors & Microcontrollers	3	100
	Paper – V	Advanced Java Programming Lab	3	100
	Paper-VI	Web Technologies Lab	3	100
				600
II	Paper - VII	Open Source Technologies	3	100
	Paper – VIII	Network Security	3	100
	Paper – IX	Data Mining and Data Warehousing	3	100
	Paper – X	C# and .Net Frame Work	3	100
	Paper – XI	Open Source Lab	3	100
	Paper - XII	Major Project	3	100
				600
		Grand Total		1200

## Paper I – OOAD AND UML

### UNIT-I

Structured approach to system construction : SSADM/SADT - An overview of object oriented systems development & Life cycle

### UNIT-II

Various object oriented methodologies – Introduction to UML

### UNIT-III

Object oriented analysis – Use cases- Object classification, relationships, attributes, methods

### UNIT-IV

Object oriented design – Design axioms – Designing classes – Layering the software design :- data access layer, User interface layer, Control/business logic layer

### UNIT-V

UML - Examples on : Behavioral models – Structural models – Architectural models from real world problems.

### TEXT BOOK:

1. Bahrami Ali, Object oriented systems development, Irwin McGrawHill, 2005 (First 4 units covered here).
2. Booch Grady, Rumbaugh James, Jacobson Ivar, The Unified modeling language – User Guide, Pearson education, 2006 (ISBN 81-7758-372-7) (UNIT -5 covered here).

## Paper II – ADVANCED JAVA PROGRAMMING

### Unit I

JDBC Overview - Connection Class – Meta Data Function – SQL Exception – SQL warning - Statement – Result Set - Other JDBC Classes.

### Unit II

Internet Address - TCP/ IP client sockets - TCP/ IP server sockets - URL - URLConnection – Data Grams - Client/ Server application using RMI.

### Unit III

Bean Development Kit - Jar Files - Introspection - Design Pattern for properties, events and methods - Constrained Properties - Persistence – Customizers

### Unit IV

Life Cycle of Servlet - Generic Servlet - HTTP Servlet - Reading Initialization Parameters - Reading Servlet Parameters - Cookies - Session Tracking

### Unit V

JApplet - Button - Combo - Trees - Tables - Panes - AWT Classes – working with Graphics, Color and Font

### Text Books

1. Patrick Naughton & Herbert Schildt, "The Complete Reference: Java 2", Tata McGraw Hill, 1999. (Chapter - 18, 21, 24, 25, 26, 27)
2. Joseph Weber, "Using Java 2 Platform", Prentice Hall of India, 2000. (Chapter - 39, 40)

### References

1. Deitel & Deitel, "Java How to Program", Prentice Hall, 5th Edition, 2002
2. Peter Hagggar, "Practical Java: Programming Language Guide", Addison-Wesley Pub Co, 1st Edition, 2000
3. Bruce Eckel, "Thinking in Java", Pearson Education Asia, 2nd Edition, 2000

## Paper III - COMPILER DESIGN

### Unit I : Introduction

Compilers – Analysis of the source program – Phases of a compiler – Cousins of the Compiler – Grouping of Phases – Compiler construction tools – Lexical Analysis – Role of Lexical Analyzer – Input Buffering – Specification of Tokens

### Unit II: Basic Data Structures

Role of the parser, Writing Grammars – Context – Free Grammars – Top Down parsing – Recursive Descent parsing – Predictive parsing – bottom –up parsing – shift Reduce Parsing – Operator Precedent Parsing – LR Parsers – SLR Parser – Canonical LR Parser – LALR Parser

### Unit III: Advanced Data Structures

Intermediate Languages – Declarations – Assignment Statements – Boolean Expressions – Case Statements – Back patching – procedure calls

### Unit IV: Sorting & Searching Techniques

Issues in the design of code generator – The target machine – Runtime Storage management – Basic Blocks and Flow Graphs – Next use Information – A simple Code generator – DAG representation of Basic Blocks – Peephole optimization

### Unit V: Files

Introduction – Principal Sources of Optimization – Optimization of basic Blocks– Introduction to Global Data Flow Analysis – Runtime Environments – Source Language issues – Storage Organization – Storage Allocation strategies – Access to non-local names – Parameter Passing

### Text Book(s)

1. Alfred Aho, Ravi Sethi, Jeffy D.Ullman, “Compilers – Principles, Techniques and Tools”, Pearson Education Asia, 2003

### References

1. Henk Alblas and Albert Nymeyer, “Practice and Principles of Compiler Building with C”, PHI, 2001
2. Kenneth C. Loudon, « Compiler Construction : Principles and Practices », Thompson Learning, 2003.

## Paper IV – MICROPROCESSORS AND MICROCONTROLLERS

### Unit I: 8086 Software Aspects

8086 Software Aspects: Intel 8086 Microprocessors – Architecture – Assembly language programming – Linking and relocation – stacks – procedures – Macros – Interrupts and Interrupt Routines – Byte & String Manipulation. 8086 System Design: Basic Configuration – System Bus timing.

### Unit II: I/O Interfaces

I/O Interfaces: Serial communication Interface – Parallel communication Interface – Programmable Timer – Keyboard and Display Controller – DMA Controller – Interrupt Controller.

### Unit III: Advanced Processors

Advanced Processors: Intel 80 X 86 family of processors – Salient features of 80286, 80386, Basic 486 Architecture: 486 memory system and memory management – Features of Pentium memory Pentium memory and I / O systems – Pentium memory management – Introduction to Pentium Pro features.

### Unit IV: 8051 Microcontrollers

8051 Microcontrollers : Introduction to 8051 Microcontrollers – 8051 Instruction Set and Programming – Hardware Features of 8051 – 8051 Interfacing examples.

### Unit V: 8096 16 bit Microcontrollers

8096 16 bit Microcontrollers : Overview of Intel 8096 microcontrollers – Instruction Set and Programming of 8096 – Hardware Features of 8096

### Text Books

- 1." Microprocessors and Interfacing", Douglas V. Hall, Tata Mcgraw Hill, 1999
- 2."The Intel Microprocessors – 8086/8088, 80186, 286, 386, 486, Pentium Pro Processor", Barry B. Brey, Prentice Hall of India Pvt. Ltd., 1998
- 3."Microprocessors and Microcontrollers", N.Senthil Kumar, M.Saravanan and S.Jeevananthan (Unit IV & V)

### Reference Books

- 1."Microcomputer Systems: The 8086 / 8088 Family Architecture, Programming & Design", Yu-Cheng Liu and Glenn A.Gibson, 2<sup>nd</sup> edition, Prentice Hall of India Pvt. Ltd., 2001
- 2."Microprocessors and Interfacing", A.P Godse and D.A. Godse

## Paper V – ADVANCED JAVA PROGRAMMING LAB

### List of exercises for practical Laboratory

1. Write an Applet which will play two sound notes in a sequence continuously use the play () methods available in the applet class and the methods in the Audio clip interface.
2. Create a Japplet using swing control, which will create the layout shown below and handle necessary events.

### Format

Enter your Name:

Enter your Age:

Select your s/w: \* Oracle \*Visual Basic

\*Java

Select your city : \*Delhi \*Mumbai

\*Chennai

OK Cancel

3. Use JDBC connectivity and create Table, insert and update data.
4. Write a program in Java to implement a Client/Server application using RMI.
5. Write a program in Java to create a Cookie and set the expiry time of the same.
6. Write a program in Java to create Servlet to count the number of visitors to a web page.
7. Write a program in Java to create a form and validate a password using Servlet.
8. Develop a Java Bean to demonstrate the use of the same.
9. Write a program in Java to convert an image in RGB to a Grayscale image.
10. Develop Chat Server using Java.

## Paper VI WEB TECHNOLOGIES Lab

Objective: In this course students shall learn to use those modern programming technologies with which he can create applications that run in a web browser environment.

Suggested exercises:

1. Create a Web Page for ABC INFOTECH LTD., With necessary images and marquee.
2. Create Web Pages which displays the menu card of a hotel. The first page should contain the list of items available. After selection of one item, the corresponding details should be displayed on the next page.
3. Create a Web Page which displays the balance sheets for the given list of companies (same as above problem).
4. Create a Web Page for XYZ INFOTECH LTD., to display the company profile employee details Balance sheet, receive resume, Customer service using links.
5. Using frames create web pages for a travel agency.
6. Create a Web Page using forms for our college students admission process. (Use list box, Push button, Radio button, Command Button, Rich text box, text box, etc where ever applicable).
7. Create a Web Page which receives suggestions from customers for a software development & consultancy agency using necessary VB Script.
8. Using VB Script language, Write a program to display the multiplication table in web page.
9. Using Java Script, display the product details of a vehicle dealer for a given date and time. Also display the details of the vehicles available. Use necessary controls where ever applicable.
10. Create a Web Page which displays the wage of style attributes and event function with demo.
11. Create a Web Page which displays the mouse co-ordinates and image coordinates.
12. Create a Web Page which displays the dynamic changing style. The web page should consist of list of cites organized in an order and the corresponding information using mouse over.

## SECOND YEAR

### Paper VII - OPEN SOURCE TECHNOLOGIES

#### UNIT I: OPEN SOURCE

Introduction : Open Source – Open Source vs. Commercial Software – What is Linux? - Free Software – Where I can use Linux? Linux Kernel – Linux Distributions

#### UNIT II: LINUX

Introduction: Linux Essential Commands – File system Concept - Standard Files - The Linux Security Model - Vi Editor - Partitions creation - Shell Introduction - String Processing - Investigating and Managing Processes - Network Clients - Installing Application

#### UNIT III: APACHE

Introduction - Apache Explained - Starting, Stopping, and Restarting Apache - Modifying the Default Configuration - Securing Apache - Set User and Group - Consider Allowing Access to Local Documentation - Don't Allow public\_html Web sites - Apache control with .htaccess

#### UNIT IV: MySQL

Introduction to MY SQL - The Show Databases and Table - The USE command - Create Database and Tables - Describe Table - Select, Insert, Update, and Delete statement - Some Administrative detail - Table Joins - Loading and Dumping a Database.

#### UNIT V: PHP

PHP Introduction- General Syntactic Characteristics - PHP Scripting - Commenting your code - Primitives, Operations and Expressions – PHP Variables - Operations and Expressions Control Statement - Array – Functions - Basic Form Processing - File and Folder Access - Cookies - Sessions - Database Access with PHP - MySQL - MySQL Functions - Inserting Records - Selecting Records - Deleting Records - Update Records.

#### Text Book

1. "Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP", James Lee and Brent Ware, Dorling Kindersley(India) Pvt. Ltd, 2008

#### Reference books

1. "Setting up LAMP: Getting Linux, Apache, MySQL, and PHP and working Together", Eric Rosebrock, Eric Filson, Published by John Wiley and Sons, 2004.



## Paper VIII - NETWORK SECURITY

### Unit I

Overview-Symmetric Ciphers: Classical Encryption Techniques

### Unit II

Symmetric Ciphers: Block ciphers and the Data Encryption Standards Public key Encryption and Hash Functions: Public-Key Cryptography and RSA

### Unit III

Network Security Practices: Authentication applications-Electronic Mail Security

### Unit IV

Network Security Practices: IP Security-Web Security

### Unit V

System Security: Intruders-Malicious Software-Firewalls

### Text Book(s)

1. William Stallings, Cryptography and Network Security-Principles and Practices, Prentice-Hall, Third edition, 2003

### References

1. Johannes A. Buchaman , Introduction to cryptography, Springer-Verlag.
2. Atul kahate , Cryptography and Network Security, TMH.

## Paper IX - DATA MINING AND DATA WAREHOUSING

Objective: In this course students shall learn the mathematical & algorithmic details of various data association techniques to discover patterns in underlying data (namely mining data).He also learn how to consolidate huge volume of data in one place efficiently.

### UNIT-I

Introduction to data mining – Association Rule Mining.

### UNIT-II

Classification – Cluster analysis.

### UNIT-III

Web Data Mining – Search engines.

### UNIT-IV

Data warehousing – Algorithms & operations to create data warehouse – Designing data warehouse- Applications of data warehouse.

### UNIT-V

Online analytical processing – Information Privacy.

### TEXT BOOK:

1. G.K.Gupta, Introduction to Data mining with case studies ,Prentice Hall India , 2006 (ISBN 81-203-3053-6) [Unit-1 :(Chapters 1,2); Unit-2 : (Chapters 3,4); Unit-3 (Chapters 5,6); Unit-4 (Chapters 7), Unit-5 (Chapters 8,9)].

### REFERENCE BOOK:

1. K.P.Soman & Shyam Diwakar and V. Ajay, Insight to Data Mining Theory and Practice, Prentice Hall of India, 2006. (ISBN -81-203- 2897-3)  
2. Jiawei Han and Micheline Kamber, Data Mining Concepts and Techniques, Elsevier, Second Edition, 2007 (ISBN: 81-312-0535-5)

## Paper X - C # AND .NET FRAMEWORK

### UNIT I

Review of OOP Concepts - Overview of .NET Framework - Basic Elements of C# - Program Structure and simple Input and Output Operations – Operators and Expressions – Statements – Arrays and Structures.

### UNIT II

Inheritance - Namespace – Polymorphism – Interface and Overloading – Multiple Inheritance – Property – Indexes – Delegates – Publish/Subscribe Design Patterns - Operator Overloading- Method Overloading

### UNIT III

C# Concepts for creating Data Structures - File Operation – File Management systems – Stream Oriented Operations- Multitasking – Multithreading – Thread Operation – Synchronization.

### UNIT IV

Working with XML – Techniques for Reading and Writing XML Data – Using XPath and Search XML - ADO.NET Architecture – ADO.NET Connected and Disconnected Models – XML and ADO.NET – Simple and Complex Data Binding– Data Grid View Class.

### UNIT V

Application Domains – Remoting – Leasing and Sponsorship - .NET Coding Design Guidelines –Assemblies – Security – Application Development – Web Services - Building an XML Web Service - Web Service Client – WSDL and SOAP – Web Service with Complex Data Types – Web Service Performance.

### TEXT BOOKS:

1. S. Thamarai Selvi and R. Murugesan “A Textbook on C# “Pearson Education, 2003.
2. Stephen C. Perry “Core C# and .NET”, Pearson Education, 2006.

### REFERENCES:

1. Jesse Liberty, “Programming C#”, Second Edition, O’Reilly Press, 2002.
2. Robinson et al, “Professional C#”, Fifth Edition, Wrox Press, 2002.
3. Herbert Schildt, “The Complete Reference: C#”, Tata McGraw Hill, 2004.
4. Andrew Troelsen, “C# and the .NET Platform”, A! Press, 2003.
5. Thuan Thai and Hoang Q. Lam, “. NET Framework Essentials”, Second Edition, O’Reilly, 2002.

## Paper XI - OPEN SOURCE LAB

1. Write a server side PHP program that displays marks, total, grade of a student in tabular format by accepting user inputs for name, number and marks from a HTML form.
2. Write a PHP program that adds products that are selected from a web page to a shopping cart.
3. Write a PHP program to access the data stored in a mysql table.
4. Write a PHP program interface to create a database and to insert a table into it.
  - i). Write a PHP program using classes to create a table.
  - ii). Write a PHP program to upload a file to the server.
5. Write a PHP program to create a directory, and to read contents from the directory.
6. Write a shell program to find the details of an user session.
7. Write a shell program to change the extension of a given file.
8. Create a mysql table and execute queries to read, add, remove and modify a record from that table.

## Paper XII – Major Project

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