BHARATHIDASAN UNIVERSITY
TIRUCHIRAPPALLI
M.Sc., Information Technology (Non Semester)
Course Structure& Syllabus
(Candidates admitted from the year 2015 onwards under Distance Education mode)

Year	Paper	Title of the Paper	Exam Hours	Marks
I	Paper –I	Data Structures and Algorithms	3	100
	Paper – II	Programming in Java	3	100
	Paper – III	Relational Database Systems	3	100
	Paper – IV	Operating Systems	3	100
	Paper – V	Programming in Java Lab	3	100
	Paper – VI	RDBMS Lab	3	100
				600
II	Paper – VII	Programming the Web	3	100
	Paper – VIII	OOAD and UML	3	100
	Paper – IX	Open Source Based Web Application Development	3	100
	Paper – X	C# and .Net Frame Work	3	100
	Paper – XI	Open Source Lab	3	100
	Paper - XII	Major Project	3	100
		Total		600
		Grand Total		1200

I - DATA STRUCTURES AND ALGORITHMS

Unit I

Introduction to data structures, Records, Arrays, Stacks, Queues, Recursion, Linked list, Binary tree and traversing.

Unit II

Sorting and Searching Techniques: Introduction, Internal and External Sorting, Insertion, Selection, Merging, Radix, Quick sort, Heap sort and Bubble sort. Searching: Introduction, Sequential search, Binary search, Binary Tree search.

Unit III

Graphs and Their applications: Introduction, Graph Theory, Terminology, Representation of graphs, Tree & Binary tree, operations on graphs, shortest path Algorithms, Topological sorting.

Unit IV

Algorithms, Development of Algorithms, basic concepts, Structured Program Concepts, Top down development of algorithms, Principle of analyzing Algorithms, Algorithms design methods, Sub goals, Hill climbing.

Unit V

Algorithms Design Techniques: Divide and Conquer algorithms, Dynamic Programming, Greedy algorithms, Backtracking and Branch & bound.

Text Books
1. Seymour Lipschitz "Data Structures, Tata McGraw-Hill
2. Ellis Horowitz & S. Sahni, Fundamenta ls of Data Structures, Galgotia Pub.
References
1. Data Structures Using C - Langsam, Augenstien, Tenenbaum, PHI
2. Data struct ures and Algorithms, V.Aho, Hopcropft, Ullman , LPE
3. Introduction to de sign and Analysis of Algorithms - S.E. Goodman, ST.
Hedetniem- TMH

Paper II - PROGRAMMING IN JAVA

UNIT-I
Introduction – Literals – Data types – The structure of Java program – Operators – Control statements

UNIT-II
Arrays – Classes - Inheritance

UNIT-III
Packages and Interfaces – Wrapper classes – mathematical methods – Exceptions

UNIT-IV
Input and Output classes

UNIT-V
Threads – Applets - Graphics.

TEXT BOOK:

1. Dr. K. Somasundaram, "Programming in Java 2", Jaico Publishing House – 2008.

REFERENCE BOOK

1. Ken Arnold, Games Gosling, David Holmes, "The Java Programming Language", 3rd Edition, TMH
2. Patric Naughton and Herbert Schildt, "Jave 2 Complete Reference", TMH, 1999
3. Nortron Peter and William Stanek, "Guide to Java Programing", Samsnet 1996

Paper III – Relational Database Systems

Unit I

Introduction – purpose of database systems – Data Abstraction – Data models – Instances and schemes – Data independence – DDL – DML – Database users – ER model – Entity sets – Keys – ER diagram – relational model – Structure – Relations Algebra – Relational Calculus – Views.

Unit II

SQL – QBE – QUEL – Basic structure – various Operations – Relational database design problems in the relational data base design – Normalisation – normalization using functional, Multi value and join dependencies.

Unit III

File and system structure – overall system structure – file Organization – data dictionary – Indexing and hashing – basic concept B and B+ tree indices– Static and Dynamic hash functions.

Unit IV

Recovery and atomicity – failures classification and types – Transaction model and Log based recovery, schedules – serial and non-serial types – Serialization of schedules and views – testing for seriability – lock based protocols – time based protocols – validation techniques – multiple Granularity – multiversion schemes – insert and delete Operations.

Unit V

Distributed data bases – structure of distributed databases – Trade offs in Distributing the database – Transparency and autonomy – distributed query processing – recovery in distributed systems – commit protocols – security and integrity violations – authorization and views – security specification – encryption – Statistical databases.

Text Book(s):
Henry F.Korth, and Abraham Silberschatz,, Sudarshan "Database system Concepts", McGraw Hill, 4th Edition, 2002

References:
1. Pipin C. Desai, "An Introduction to data base systems", Galgotia Publications Private Limited, 1991.
2. C.J. Date, "An Introduction to Database Systems", 3rd Edition, Addison Wesley 1983.

Paper IV - OPERATING SYSTEMS

Unit I :

Operating Systems Objectives and functions – Operating System and User /Computer Interface, Operating System as a Resource Manager: Evaluation of Operating Systems – Serial Processing, Sample Batch Systems, Time Sharing Systems.

Unit II :

Process Description, Process Control –Processes and Threads. Concurrency – Principles of Concurrency, Mutual Exclusion – Software support, Dekker's Algorithm – Mutual Exclusion – Hardware support, Mutual Messages – Deadlock – Deadlock prevention, Deadlock Detection, Deadlock Avoidance – An Integrated deadlock Strategy.

Unit III :

Memory Management – Memory Management Requirements – Fixed Partitioning, Placement Algorithm, Relocation in a Paging System – Sample Segmentation. Virtual Memory – Paging – Address Translation in a Paging System. Segmentation – Organization, Address Translation in a Segmentation System – Combined Paging and Segmentation – Virtual Memory – Operating System Software – Fetch Policy, Placement Policy and replacement Policy, Page buffering resident set Management.

Unit IV :

Scheduling – Types of Scheduling, scheduling Algorithms, scheduling criteria, FIFO, Round Robin, Shortest Process next, Shortest Remaining Time, Highest response ratio and Feedback scheduling Performance comparison – Fair – Share Scheduling. I/O Management and disk scheduling – Organization of the I/O function – the Evaluation of the I/O function, Logical structure of the I/O function, I/O Buffering, Disk Cache.

Unit V :

File Management – Files, File Management Systems, File System Architecture, Functions of File Management File Directories – File Sharing – Secondary Storage Management – File allocation.

Text Books
1. William Stallings, "Operating Systems", Second edition, Maxwell McMillan,
International Editions, 1997.
2. Charles Crowley, "Operating Systems-A Design Oriented Approach", IRWIN
Publications Chicago, 1997.
References
1. Dental H.M. "An Introduction to Operating Systems", Addison Wesley Publishing
Co. 1998.
2. Silberchatz A. Peterson J.L., Galvan P. "Operating System Concepts", Third Edition,
                Addison Wesley Publishing Co., 1992.

Paper V - PROGRAMMING IN JAVA LAB

Objective: To teach students how to program in JAVA language (from an
advanced perspective) and use certain object oriented concepts in
programming.
Suggested exercises:
1. Write a JAVA program to sort the given numbers using arrays.
2. Write a JAVA program to implement the FIND and REPALCE operations in the given
multiple text.
3. Write a JAVA program to implement a calculator to perform basic arithmetic operations.
4. Write a JAVA program to handle the division by zero operation.
5. Write a JAVA program to use inheritance.
6. Write a JAVA program to find the area of a rectangle using constructor
7. Develop an applet to get interactive input for adding two numbers and display the sum of the
same applet.
8. Write a JAVA program to create buttons in a frame that displays the information on clicking
it.
9. Write a JAVA program to display the mouse co-ordinates.
10. Write a JAVA program to display the item selected from a drop-down list.
11. Write a JAVA program to find the student's percentage and grade using command line
arguments.
12. Write a JAVA program to create threads and assign priorities to them
13. Write a JAVA program to develop an applet to play multiple audio clips using multithreading.
14. Write a JAVA program to create a window with three check boxes called red, green and blue.
The applet should change the colors according to the selection.
15. Write a JAVA program to display the file name chosen from the file dialog box.
16. Write a program to handle File open, read, write operations.
17. Write a program to draw circle or triangle or square using polymorphism and inheritance.
18. Use JDBC to connect to a database and retrieve /insert/update rows of data. Design an applet
based GUI to carryout these operations.

Paper VI - RDBMS LAB (Oracle 9i with SQL)
1. Creating & updating and inserting into database & simple queries.
2. Uses of Select statement - for queries.
a. AND' OR' NOT Operators' WHERE clause.
b. UNION' INTERSECTION' MINUS.
c. Sorting and grouping.
3. Nested queries using SQL.
a. Sub queries.
b. Join.
4. Built-in-functions of SQL.
5. Use of indexes' creating views and querying in views.
6. Cursors' triggers and stored procedures and functions.
7. Case studies:
a. Student evaluation systems.
b. Pay - roll system
c. Income tax calculations.
d. Seat reservation Problems
e. Mark - sheet Preparation.

SECOND YEAR

Paper VII - PROGRAMMING THE WEB

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

UNIT-I
Fundamentals of web technology - Introduction to HTML and XHTML – Cascading Style Sheets.
UNIT-II

Basics of JAVASCRIPT – JAVASCRIPT and HTML Documents.

UNIT-III
Dynamic Documents with JAVASCRIPT – JAVA APPLETS.

UNIT-IV
Introduction to XML – Basics of PERL – Using PERL for CGI Programming.

UNIT-V
Introduction to Web Server and Servlets – Introduction to PHP – Database Access through the Web.

TEXT BOOK:
1. Robert W. Sebesta, Programming the World Wide Web, Pearson education, Second Edition,2005 (ISBN 81-297-0439-0) [Unit-1 :(Chapters 1,2,3);
Unit-2 : (Chapters 4,5); Unit-3 (Chapters 6,7); Unit-4 (Chapters 8,9,10);Unit-5 (Chapters 11,12,13)]

REFERENCE BOOK:
1. H.M. Deitel, P.J. Deitel and A.B. Goldberg, Internet and World Wide Web - How to Programme, Prentice Hall of India, Third Edition, 2006 (ISBN 81-7758- 239-9).
2. BAYROSS IVAN, Web enabled commercial application development using HTML, DHTML, Java script, Perl CGI, 2nd revised edition, BPB publishing, 2002 (ISBN 81-7656-274-2).

Paper VIII 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 IX - OPEN SOURCE BASED WEB APPLICATION DEVELOPMENT

UNIT-I
Installing LAMP stack (Linux, Apache, MySQL, PHP suite)- Configuring installation – Creating
PHP pages – ingenerating MySQL with PHP.

UNIT-II
Web forms and user data manipulation – Basic data manipulation using PHP/MySQL forms

UNIT-III
Validating user inputs – Handling errors in form.

UNIT-IV
Case study: Building content management system using LAMP stack

UNIT-V
Configuring log files to improve LAMP stack based web site – Troubleshooting
web site.

TEXT BOOK:
1. Naramore Elizabeth, Gerner Jason, et aln.., Beginning PHP5, Apache, MySQL web development,
   Wrox press/Wiley Dreamtech press, 2005 edition. (ISBN 81-265- 0581-8) [Unit-1 :(Chapters 1,2);
   Unit-2 : (Chapters 3,4,5,6); Unit-3 (Chapters 8,9); Unit-4 (Chapters 13), Unit-5 (Chapters 17,18)]

2. Bayross Ivan, Web enabled commercial application development using HTML,
DHTML, JavaScript, Perl CGI., BPB publications, 2nd revised edition, 2002.

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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