

Veer Narmad South Gujarat University
Surat

Master of Science (Information Technology)
[Five Year Integrated Course]

Semester :5

Syllabus
(Revised)

Effective from June 2010

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VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
M.Sc. (I.T.) [Five Year Integrated Course]
B.Sc. (Information Technology)
Semester V
Teaching and Evaluation Scheme

Paper Sr. No.	Paper Title	Teaching Schedule (Hours/Week)			University Exam Theory / Practical		Internal Exam Theory / Practical		Total Theory / Practical
		Lect	Tut	Prac	Duration Hrs.	Marks	Duration Hrs.	Marks	
501	ASP .NET	4	-	-	3	70	2	30	100
502	RDBMS-II	4	-	-	3	70	2	30	100
503	Computer Graphics	4	-	-	3	70	2	30	100
504	System Analysis and Design	4	-	-	3	70	2	30	100
505	Operating System	4	-	-	3	70	2	30	100
506	Practicals			10	5	140	3	60	200
	Total		30			490		210	700

RDBMS – Relational Database Management System

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M.Sc. (Information Technology) Programme
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Semester V

Paper No : 501

L: 4 Hrs

Paper Title : ASP.NET

1. Introduction to Framework

- 1.1 Dot Net architecture
- 1.2 MSIL, CLR, CLS, CTS
- 1.3 Namespace, Assembly
- 1.4 Garbage Collection and memory management

2. Web development concepts

- 2.1 Dynamic web pages
- 2.2 Introduction to ASP
- 2.3 Web server – Internet Information Server (IIS)

3. Concepts of ASP.NET

- 3.1 Architecture of ASP.NET
- 3.2 Lifecycle of web page
- 3.3 ASP .NET Page Directives

4. Programming of ASP.NET (With VB.NET)

- 4.1 Delegates, Events
- 4.2 Controls – HTML controls and ASP.Net server controls
- 4.3 Validation controls, Control Events
- 4.4 Postback, Exception handling
- 4.5 Navigation Controls, Login Controls, MasterPages

5. Web Application Management

- 5.1 ViewState, Response object, Request object
- 5.2 Server object, web.config, global.asax

6. ASP.NET Authentication Methods

- 6.1 Windows-Based Authentication
- 6.2 Passport-Based Authentication
- 6.3 Form-Based Authentication

7. Working with ADO.NET

- 7.1 Architecture of ADO.NET
- 7.2 Connection object, DataAdapter, DataReader
- 7.3 Command object, DataSet
- 7.4 Working with Data Controls

8. Maintaining Application State

- 8.1 Using Cookie
- 8.2 Using Session
- 8.3 Using Profiles

9. ASP .NET User Control

10. Caching

- 10.1 When to use Caching
- 10.2 Caching in ASP .NET
- 10.3 Caching Techniques
 - 10.3.1 Page Output
 - 10.3.2 Partial Page
 - 10.3.3 Data Source

Main Readings:

1. Beginning ASP.NET using VB.NET – Wrox.
2. ASP.NET A Beginner's guide – TMH – Dave Mercer.
3. Beginning VB.NET – Wrox.

Supplementary Reading:

1. Visual Basic .Net Programming Black Book. – Dreamtech.
2. Visual Basic .Net Programming – Peter Aitken's - Dreamtech.
3. Developing Web Applications with Visual Basic .Net and ASP.Net. – Dreamtech.
4. Professional VB.NET – Wrox.
5. Professional ASP.NET – Wrox.
6. ASP.NET Programmer's Reference – Wrox
7. ADO.NET Programmer's Reference – Wrox.
8. Special Edition Using ASP.NET –Pearson Education – Richard Leinecker.
9. ASP.NET Unleashed. – Techmedia – Sams.
10. ASP.NET for Developers – Tecmedia – Amundsen.

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Paper No : 502

L: 4 Hrs

Paper Title: RDBMS-II

1. Client/Server Computing Model

2. Overview of Oracle Architecture

- 2.1 Oracle Physical Architecture
- 2.2 Oracle Instance Architecture

3. Transaction Control Statements

Commit, Savepoint, Rollback

4. Indexes

- 4.1 Simple Index, Composite Index
- 4.2 Bitmap Index, Function Based Index
- 4.3 Key Compressed Index

5. Introduction to PL/SQL

- 5.1 The PL/SQL Block
- 5.2 Lexical Units: Identifiers, Delimiters, Literals, Comments
- 5.3 Variables, PL/SQL Types
- 5.4 Expression & Operators, Control Structures
- 5.5 Records

6. Cursors

- 6.1 What is a Cursor, Explicit & Implicit Cursors
- 6.2 Cursor for loops, Cursor Variables, Parameterized Cursor

7. Procedures & Functions

- 7.1 Subprogram Creation, Parameter Modes
- 7.2 Procedure Versus Functions

8. Packages

- 8.1 Package Specification
- 8.2 Package Body
- 8.3 Packages and Scope, Package Objects

9. Database Triggers

- 9.1 Use of Database Triggers
- 9.2 Types of Triggers, Creating Triggers
- 9.3 Deleting a Trigger

10. Error Handling

- 10.1 Declaring Exception
- 10.2 Raising Exception, Handling Exception
- 10.3 Exception Propagation, Scope of Exception

11. Sequences & Pseudo columns

CURRVAL & NEXTVAL, LEVEL, ROWID, ROWNUM

12. Object Oriented Programming In Oracle:

- 12.1 Object Types: Nested Tables, Varying Array
- 12.2 Large Objects, References
- 12.3 Object Views

13. PL/SQL Security:

Locks, Types of Locks, Levels of Locks

14. User, Role and Profile

15. SQL *Plus

- 15.1 Using SQL*Plus for Editing
- 15.2 Using SQL*Plus to Work with Files
- 15.3 Using SQL*Plus for Formatting Output ,Using SQL*Plus Variables

Main Readings:

1. SQL / PLSQL – Ivan Bayross – BPB Publication
2. Oracle Database Administration – The Essential Reference – David & Brian – O'Reilly
3. The Complete Reference – Oracle Press – George Koch
4. Oracle8 How – To – Techmedia

Supplementary Readings:

1. Oracle9i PL/SQL Programming – Scott Urman – Oracle Press – TMH
2. Oracle9i DBA Handbook – Kevin Loney – Oracle Press – TMH
3. Oracle9i Web Development – Bradley – Oracle Press – TMH

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Paper No : 503

L: 4 Hrs

Paper Title : Computer Graphics

1. Geometry & Line Generation

- 1.1 Geometry, Pixel & frame buffer,
- 1.2 Vector Generation : VECGEN & BRASENHAM Algorithm
- 1.3 Character Generation, Circle drawing

2. Graphics Primitives

- 2.1 Display Devices
- 2.2 Line & point plotting systems, Raster, Pixel & Point plotters, Continual refresh & storage displays, Plasma Panel displays etc.
- 2.3 Primitive operations
- 2.4 Text

3. Polygons

- 3.1 Polygon & its representation
- 3.2 Inside Tests : Even Odd and Winding number method
- 3.3 Filling polygons
 - 3.3.1 Flood & Scan line fill
 - 3.3.2 Filling with a pattern

4. Transformation

- 4.1 Introduction to Matrices
- 4.2 Transformations
 - 4.2.1 Scaling Transformation, Rotation, Translation, Rotation about Arbitrary Point, Inverse and other Transformations

5. Segments

- 5.1 Introduction to segments
- 5.2 Segment table
- 5.3 Various operations on segments

6. Windowing & Clipping

6.1 Windowing, The viewing transformation, Multiple windowing

6.2 Clipping

6.2.1 Cohen - Sutherland outcode Algorithm

6.2.2 Sutherland - Hodgman Algorithm

6.3 Generalized Clipping

7. 3D Graphics

7.1 Geometry Of 3D, 3D primitives & Transformations

7.2 Projection - parallel, isometric

7.3 3D Windowing & Clipping

8. Dimensional Perspective Geometry

8.1 Geometric Projections

8.2 Orthographic Projections

8.3 Oblique Projections

8.4 Perspective Transformations

8.4.1 Single-Point Perspective Transformation

8.4.2 Two-Point Perspective Transformation

8.4.3 Three-Point Perspective Transformation

Main Readings :

1. Computer Graphics : Programming Approach. – Harrington S. – Tata McGraw Hill
2. Interactive Computer Graphics – Giloi W.K. – PHI
3. Principles Of Interactive Computer Graphics - Newman W. & Sproul P.F. – McGraw Hill

Supplementary Readings :

1. Procedural Elements for Computer Graphics. – Rogers D.F. – Mc Graw Hill
2. Fundamentals Of Interactive Computer Graphics. – Foley J.D., Vandam A. – Addison Wesley
3. Computer Graphics – Hearn D., Baker P.M. – Prentice Hall
4. Computer Graphics – Dr. Apurva A. Desai - PHI

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Paper No : 504

L: 4 Hrs

Paper Title : System Analysis & Design.

1. Introduction to information systems development

- 1.1 System Analysis & Design : An Overview
- 1.2 System Analyst & Users : Responsibilities
- 1.3 Information Systems : Categories
- 1.4 Problems with the Software Development
- 1.5 Structured Analysis method: SDLC
- 1.6 System Prototype Method
- 1.7 Emergence of Software Engineering
 - 1.7.1 Characteristics of Software
 - 1.7.2 Introduction to Software Engineering
- 1.8 Software life cycle models
 - 1.8.1 Waterfall model
 - 1.8.2 Prototyping model
 - 1.8.3 Incremental model
 - 1.8.4 Spiral model

2. Analysis

- 2.1 Feasibility Study
- 2.2 Feasibility Considerations
- 2.3 Steps in Feasibility Analysis
- 2.4 Cost and Benefit Analysis

2. Requirement Analysis & specifications

- 2.1 Fact Finding Techniques
- 2.2 Structured analysis: Tools & Techniques
- 2.3 Data Flow Diagrams
- 2.4 E - R Diagrams
- 2.5 Introduction to UML
- 2.6 Data dictionary
- 2.7 Decision Trees, Decision Tables
- 2.8 Components of Requirement specification, Software Requirement Specification (SRS) Document

3. System Design

- 3.1 Design Concepts & Principles
- 3.2 Problem Partitioning and Hierarchy, Abstraction
- 3.3 Modularity, Top-down and Bottom-up Strategies
- 3.4 Top Down Structure: Coupling and Cohesion, Span of Control
- 3.5 Module Size, Shared Modules
- 3.6 Interface/IO Design

4. Testing & Implementation

- 4.1 Testing Fundamentals
- 4.2 Black Box Testing and White Box Testing
- 4.3 Testing Strategies
- 4.4 Test Case Specifications and Execution
- 4.5 Software Maintenance, Types of Software Maintenance

Case studies may be carried out at appropriate stages of the course.

Main Readings :

1. Analysis and Design of Information Systems – James A Senn -McGraw-Hill International Editions
2. Fundamentals of Software Engineering – Rajib Mall - PHI
3. An Integrated Approach to Software Engineering - Pankaj Jalote - Narosa Pub.
4. Software Engineering – A practitioner's approach – Roger S Pressman – McGraw Hill

Supplementary Readings :

1. System Analysis & Design - Elias M Awad - Galgotia Publ,1997
2. Elements of System Analysis - Marvin Gore - Galgotia Publ
3. Software Engineering Concepts - Fairley R E - Mc-Graw Hill
4. Fundamentals of Software Engineering – Carlo Ghezzi
5. Software Reuse – Ivar Jacobson Martin Gris
6. Systems analysis & Design and the transition to objects:Sandra D Dewitz, McGraw Hill
7. System analysis & Design Methods: Whitten, Bentley & Barlow, Galgotia, 1995

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Paper No : 505

L: 4 Hrs

Paper Title: Operating System

1. Operating System Concepts

- 1.1 Evolution of Operating System
- 1.2 Needs of an Operating System
- 1.3 Single User & Multi-user Operating Systems
- 1.4 Elements of an Operating System
- 1.5 Operating System as a Resource Manager
- 1.6 Different types of O.S.: batch, multi-programmed, time-sharing, real-time, distributed, parallel, mobile
- 1.7 Operating system structure (simple, layered, virtual machine)

2. Process Management

- 2.1 Process State Model
- 2.2 Process concept
- 2.3 Process Scheduling
 - 2.3.1 Scheduling algorithms
 - 2.3.2 Process coordination
 - Producer/Consumer problem, Critical Section problem, Semaphores
 - Language Constructs, Interprocess Communication, Deadlocks
- 2.4 Implementation in various operating systems

3. Memory Management:

- 3.1 Single Contiguous Allocation: H/W Support, S/W Support
- 3.2 Introduction to Multiprogramming : Concept of Multiprogramming
- 3.3 Contiguous allocation Partitioned memory static & dynamic allocation, Segmentation
- 3.4 Non-Contiguous allocation
 - Paging, Demand Paging & Segmentation, Allocation & Replacement policies
- 3.5 Other Memory Management Schemes (Swapping, Overlays)
- 3.6 Implementation in various operating systems

4. Device Management

- 4.1 Device characteristics: Hardware Considerations
- 4.2 Different types of Devices: Dedicated Devices, Shared Devices, Virtual Devices
- 4.3 Storage Devices; Channels and Control Units : Independent Device
- 4.4 Operation, Buffering, Multiple Paths, Block Multiplexing ; Device Allocation Considerations
- 4.5 Disc space Management: Allocation & Disc Scheduling methods
- 4.6 Implementation in various operating systems

5. Information Management

- 5.1 Introduction, A Simple File System, General Model of a File System
- 5.2 Different types of File System, Basic File System, Access Control Verification, Logical File System, Physical File System
- 5.3 Directory structure organization
- 5.4 File protection
- 5.5 Implementation in various operating systems

6. Protection & Security

- 6.1 Goals of Protection
- 6.2 Domain of Protection
- 6.3 Security Problem
- 6.4 Program Threats
- 6.5 System and Network threats
- 6.6 Threat Monitoring
- 6.7 Various Preventive Measures

Main Readings :

- 1. Operating Systems Concepts - Galvin Silberschatz - McGraw Hill
- 2. Operating Systems - Stallings - PHI

Supplementary Readings :

- 1. Advanced MSDOS - Ray Duncon - McGraw Hill
- 2. Advanced Unix -A Programmer's Guide - Stephen Prata - SAMS
- 3. User Manual of DOS, Windows-Windows-NT, Netware
- 4. Netware for dummies - Dummy Series
- 5. Unix Concepts And Application - Das - McGrawHill
- 6. UNIX for you - Koparkar - McGraw Hill
- 7. A Student's guide to UNIX - H. Hahn - McGraw Hill

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Paper No : 506

L: 0, T:0, P:10 Hrs

Paper Title : Practicals.

Practical shall be conducted for the Papers 501, 502 and 503

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Master of Science (Information Technology)
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Semester :6

Syllabus
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M.Sc. (I.T.) [Five Year Integrated Course]
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Semester VI
Teaching and Evaluation Scheme

Paper Sr. No.	Paper Title	Teaching Schedule (Hours/Week)		University Exam Theory / Practical Duration		Internal Exam Theory / Practical Duration		Total Theory / Practical
		Lect	Prac	Hrs.	Marks	Hrs.	Marks	
601	Java	4	-	3	70	2	30	100
602	Linux Administration and Shell Programming	4	-	3	70	2	30	100
603	Web Development-II	4	-	3	70	2	30	100
604	Project	-	8	-	140	-	60	200
606	Practicals		10	5	140	3	60	200
Total		30			490		210	700

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
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Semester VI

Paper No. : 601
Paper Title : Java

L: 4 Hrs

1. Introduction to java

- 1.1 Features
- 1.2 Tool chain
- 1.3 Getting started with java

2. Language essentials

- 2.1 Data types, variable declarations
- 2.2 Keywords and operators
- 2.3 loops and logic
- 2.4 arrays and string
- 2.5 Other wrapper classes
- 2.6 StringBuffer class

3. Classes and objects

3.1 Basics

- 3.1.1 Simple class
- 3.1.2 Abstract class and methods
- 3.1.3 final class and methods
- 3.1.4 Inner class
- 3.1.5 Access specifiers and modifiers to classes
- 3.1.6 Methods and blocks
- 3.1.7 Packages, CLASSPATH and import statement

3.2 Inheritance

- 3.2.1 Inheritance and variables
- 3.2.2 Method overriding
- 3.2.3 Class, variable, method and constructor modifiers
- 3.2.4 Chaining constructor using this() and super()
 - 3.2.4.1 this() constructor call
 - 3.2.4.2 super() constructor call

3.3 Garbage Collection

- 3.3.1 The finalize() method

3.4 Interfaces

3.4.1 Interface and references

3.4.2 Interface inheritance

3.4.3 instanceof operator

4. Exceptions

4.1 Exception and error classes

4.2 Exception handling

4.3 throw statement and throws clause

4.4 Custom exception

5. Multithreaded programming

5.1 Overview of threads

5.2 Creating threads

5.3 Multithreaded programs

5.4 Synchronization

5.5 Deadlock

5.6 thread communication

6. Serialization and fileI/O

6.1 Files and directories

6.2 Character streams

6.3 Buffered character streams

6.4 PrintWriter class

6.5 Byte streams

6.6 Random access files

6.7 Serialization and transient keyword

6.8 Deserialization

7. Java packages

7.1 Collections and maps

7.2 Utility classes

8. Annotations

8.1 Creating and Using them

9. Introduction to Applets

9.1 Applet Basics

9.2 An Applet Skeleton

9.2.1 Applet Initialization & Termination

9.2.2 Overriding update()

- 9.3 Simple Applet Display Methods
- 9.4 Requesting Repainting
- 9.5 Using the Status Window
- 9.6 the HTML APPLET Tag
- 9.7 Passing Parameters to Applet
- 9.8 GetDocumentBase(), getCodeBase(), AppletContext & show Document()
- 9.9 The AudioClip Inter
- 9.10 The AppletStub Interface
- 9.11 Sandbox Security in Applets
- 9.12 Life Cycle of Applets
- 9.13 Creating and Using Applets
 - 9.13.1 Using Browser and AppletViewer tool
- 9.14 Use of security tool for configuring security in applet

10. Event handling

- 10.1 Delegation model
- 10.2 Event classes and listeners
- 10.3 Adapter classes
- 10.4 Anonymous inner classes

11. Abstract window toolkit

- 11.1 Labels, Buttons, Check boxes, check box groups choices, text fields, text areas, lists and scrollbars
- 11.2 Layout managers

12. Java bean

- 12.1 What is a Java Bean?
- 12.2 Advantages of Java Beans?
- 12.3 JAR Files and utility
- 12.4 Introspection Properties and events
- 12.5 Using Bound Properties
 - 12.5.1 Steps
 - 12.5.2 Using the Bean Info Interface
- 12.6 Constrained Properties
- 12.7 Persistence
- 12.8 Customizers
- 12.9 Custom event delegation and listeners
- 12.10 Reflection

13. An Introduction to JDBC

Main Readings:

1. Java 2 The complete reference 5th ed. - Schildt, Herbert - TMH

Supplementary Readings:

1. Java 2 Platform – Jaworski, Jamie , Techmedia
2. Java 2 developers handbook – Heller, Phili & Roberts,Siman – BPB
3. Teach your self java – Joseph, O'neil , TMH
4. Java programmers reference, Palmer,Grant - WROX

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Semester VI

Paper No. : 602**L: 4 Hrs****Paper Title : Linux Administration & Shell Programming**

1. Overview of Linux

- 1.1 Architecture of Linux
- 1.2 Architecture of Kernel
- 1.3 Shell Features and Shell Types
- 1.4 Booting Process and System profiles

2. Shell and Basic Commands

- 2.1 Login process and Login shell
- 2.2 User profiles and its customization
- 2.3 Understanding Linux command line structure
- 2.4 Elementary commands like pwd, who, passwd, man, tty etc.
- 2.5 Editor

3. Shell Programming - I

- 3.1 Variables – User and system
- 3.2 Assignment statement & I/O statements
- 3.3 Escaping & Quoting
- 3.4 Redirection & Piping
- 3.5 Command substitution & Command grouping
- 3.6 Shell script
- 3.7 Different ways of executing scripts
- 3.8 Commands like cut, paste, set, unset

4. Shell Programming - II

- 4.1 Positional parameters and others like \$@, \$*, \$#, \$? etc
- 4.2 Conditional execution (&& and ||)
- 4.3 Operators – arithmetic, relational, logical, file related, string related
- 4.4 Arithmetic & String manipulation – expr, let (if available in default shell)
- 4.5 Conditional and Looping Statements like if, case, while, until, for
- 4.6 test command
- 4.7 Exporting shell variables
- 4.8 Array (if available in default shell)
- 4.9 Functions
- 4.10 Commands like eval, exec, trap

5. Filtering utilities

- 5.1 grep, grep and fgrep
- 5.2 sed
- 5.3 awk / nawk, gawk (which ever available)

6. Linux System Administration

- 6.1 Introduction
- 6.2 Installation
- 6.3 GNOME/KDE environment
- 6.4 Package management
- 6.5 User management
- 6.6 Log files
- 6.7 Introduction to System calls
- 6.8 General Administrative tasks
 - 6.8.1 Setting up LAN
 - 6.8.2 Setting up Print Server
 - 6.8.3 File Servers – SAMBA, NFS
- 6.9 Linux Services
 - 6.9.1 Manipulating Services

Main Readings:

1. The UNIX Programming Env. – Kernigh & Pike – PHI
2. Your UNIX the ultimate Guide – S. Das – TMH
3. UNIX Shells – Bourn, Korn & C – Vijay Mukhi – BPB
4. Linux Administration Handbook – Nemeth, Snyder, Hein- Pearson Edu.

Supplementary Readings :

1. The complete reference Linux – Richard Peterson – TMH
2. Unix for Super User – Addison Wesley
3. C & UNIX Programming – N Kutti
4. Working with UNIX – Vijay Mukhi – BPB
5. Linux Complete Reference.

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Semester VI

Paper No : 603**L: 4 Hrs****Paper Title: Web Development-II**

1. Introduction to Web Technology

- 1.1 Web, Client-Server Communication Architecture
- 1.2 Request and response packets headers, Stateless HTTP Protocol
- 1.3 Request Types, Response Types, Dynamic content generation

2. Introduction to PHP

- 2.1 Language Characteristics
- 2.2 Features
- 2.3 PHP Extensions

3. Language Basics

- 3.1 Language constructs, Variables
- 3.2 Declarations and types, Constants
- 3.3 Use of Operators, Control Structures
- 3.4 Arrays, Functions

4. Configuration and Super Global Arrays

- 4.1 PHP Configuration Directives, php.ini file
- 4.2 Handling Session, Cookies, Form Data, File Uploads, Server Data, Server Environment
- 4.3 Handling Form Data Using JavaScript
- 4.4 Securing Request Data, Using CAPTCHA, Session Fixation Attack and Remedy

5. Object Oriented Features of PHP

- 5.1 Classes and Objects
- 5.2 Use Of constructors
- 5.3 Serialization

6. PHP In-built functions

- 6.1 String Functions, Array Functions, Mathematical Functions
- 6.2 File System Functions, Date and Time Functions
- 6.3 Files and Directory Functions, XML Functions
- 6.4 HTTP Functions, PHP Options and Information Functions, Misc. Functions

7. Database concepts with PHP

- 7.1 Configuring the MySQL Server
- 7.2 Starting MySQL Server, MySQL Tables
- 7.3 Displaying MySQL Database
- 7.4 Adding and removing user access, Checking and fixing database
- 7.5 Working with PhpMyAdmin, Mysql Functions, Error Handling
- 7.6 SQL Injection Attack and Prevention

8. Introduction to AJAX with PHP

9. Templates

- 9.1 Templating systems: PHP itself
- 9.2 Smarty

10. Introduction to MVC Frameworks

- 10.1 PHP frameworks and libraries: PEAR
- 10.2 Zend Framework, CakePHP etc.

Main Readings:

- 1. Mastering PHP 4.1 – Jeremy Allen and Charles Hornberger – BPB publications
- 2. PHP Cookbook – David Sklar and Adam Trachtenberg – O'Reilly

Supplementary Readings:

- 1. Programming PHP – Rasmus Lerdorf and Kevin tatroe – O'Reilly
- 2. PHP 5 and Mysql – Tim converse, Joyce Park and Clark Morgan – Bible Wiley

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M.Sc. (I.T.) [Five Year Integrated Course]
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Semester VI

Paper No : 604

Paper Title : Project.

P:8 Hrs

The students are required to carry out project work during the semester based upon the theoretical subjects.

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Semester VI

Paper No : 606

L: 0, T:0, P:10 Hrs

Paper Title : Practicals.

Practical shall be conducted for the Papers 601, 602 and 603