Veer Narmad South Gujarat University
Surat

Master of Information Technology
[Five Year Integrated Course]

Semester : 5 & 6

Revised Syllabus
(Based on CBCS)

Effective from June 2013-2014

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

Teaching and Evaluation Scheme

Course Code	Course Type	Course Name	External Marks	Internal Marks	Total Marks	Contact Hours	Credits	External Exam Duration
501	CORE	ASP .NET	70	30	100	4	4	3
502	CORE	RDBMS-II	70	30	100	4	4	3
503	CORE	Computer Graphics	70	30	100	4	4	3
504	CORE	System Analysis and Design	70	30	100	4	4	3
505	CORE	Operating System	70	30	100	4	4	3
506	CORE	Practical	140	60	200	10	5	5
		TOTAL	490	210	700	30	25	-

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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 **Credits: 4**

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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, Master Pages

5. Web Application Management

5.1 View Stat, 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

References:

1	ASP.NET A Beginner's guide	Dave Mercer	TMH
2	ASP.NET for Developers	Amundsen	Tecmedia
3	ASP.NET Bible	Mridula Parihar	WILEY
4	Visual Basic .Net Programming Black Book	-	Dreamtech
5	Developing Web Applications with Visual Basic .Net and ASP.Net.	-	Dreamtech
6	Professional VB.NET	-	Wrox
7	Professional ASP.NET	-	Wrox
8	ASP.NET Unleashed	Sams	Techmedia
9	Murach's ASP.NET upgrade's guide	Anne Boehm	SPD
10	Professional .NET framework	Kevin Hoffman	SPD
11	Beginning ASP.NET databases using VB.NET	John Kauffman	Wrox
12	Programming Microsoft ASP.NET	Dino Esposito	Microsoft press

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Paper No : 502 **L: 4 Hrs**
Paper Title: RDBMS-II **Credits: 4**

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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 Definition of Cursor
6.2 Explicit & Implicit Cursors
6.3 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
9.3 Creating Triggers
9.4 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. Database Schema Design Case Studies

References:

1	SQL / PLSQL	Ivan Bayross	BPB Publication
2	Oracle Database Administration – The Essential Reference	David & Brian	O'Reilly
3	The Complete Reference	George Koch	Oracle Press
4	Oracle high Performance Tuning for 9i & 10G	Gavin Powell	Digital Press
5	Oracle database 11g-Hands on SQL & PL/SQL	Satish Asnani	PHI publication
6	Oracle9i DBA HandBook	Kevin Loney	Oracle Press – TMH
7	Oracle9i Web Development	Breadley	Oracle Press – TMH
8	Oracle9i PL/SQL Programming	Scott Urman	Oracle Press – TMH

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Paper No : 503 **L: 4 Hrs**
Paper Title : Computer Graphics **Credits: 4**

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1. Geometry and Graphics primitives

1.1 Geometry, Pixel & frame buffer,
1.2 Vector Generation : VECGEN & BRASENHAM Algorithm
Character Generation, Circle drawing – midpoint circle algorithm
1.3 Graphics Primitives

2. Polygons

2.1 Polygon & its representation
2.2 Inside Tests: Even Odd and Winding number method
2.3 Filling polygons

2.3.1 Flood & Scan line fill
2.3.2 Filling with a pattern

3. Transformation

3.1 Introduction to Matrices
3.2 Transformations
3.3 Scaling Transformation, Rotation, Translation
3.4 Rotation about arbitrary Point, Inverse and other Transformations
3.5 Reflections and shearing

4. Segments

4.1 Introduction to segments
4.2 Segment table
4.3 Various operations on segments

5. Windowing & Clipping

5.1 Windowing, The viewing transformation, Multiple windowing
5.2 Clipping

5.2.1 Cohen - Sutherland outcode Algorithm
5.2.2 Sutherland - Hodgman Algorithm
5.3.3 Weiler and Ahterton polygon clipping
5.3 Generalized Clipping

6. 3D Graphics

6.1 3-D geometric primitives
6.2 3-D object representation
6.3 3-D transformations
6.4 3-D viewing
6.5 Projections
6.6 3D clipping

7. Dimensional Perspective Geometry

7.1 Geometric Projections
7.2 Orthographic Projections
7.3 Oblique Projections
7.4 Perspective Transformations

7.4.1 Single-Point Perspective Transformation
7.4.2 Two-Point Perspective Transformation
7.4.3 Three-Point Perspective Transformation

8. Curves and Surfaces

9. Introduction to image processing and it's applications

References:

1	Computer Graphics: Programming Approach	Harrington S.	Tata McGraw Hill
2	Computer Graphics	Dr. Apurva A. Desai	PHI
3	Computer Graphics	Hearn D., Baker P.M.	Prentice Hall
4	Principles of Interactive Computer Graphics	Newman W. & Sproul P.F.	McGraw Hill
5	Fundamentals of Interactive Computer Graphics	Foley J.D., Vandam A.	Addison Wesley
6	Digital image processing using MATLAB	-	-
7	Digital Image Processing	Rafael C. Gonzalez, Richard E woods	Pearson Education

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Paper No : 504 **L: 4 Hrs**
Paper Title : System Analysis & Design **Credits: 4**

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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

5. Introduction to recent paradigm

5.1 Agile Software Development
5.2 Rational Unified Process

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

References:

1	Fundamentals of Software Engineering	Rajib Mall	PHI
2	An Integrated Approach to Software Engineering	Pankaj Jalote	Narosa Pub.
3	Software Engineering – A practitioner's approach	Roger S Pressman	McGraw Hill
4	System Analysis & Design	Elias M Awad	GalgotiaPubl,1997
5	Analysis and Design of Information Systems	James A Senn	McGraw-Hill International Editions
6	Software Engineering Concepts	Fairley R E	Mc-Graw Hill
7	Fundamentals of Software Engineering	Carlo Ghezzi	-
8	Systems analysis & Design and the transition to objects	Sandra D Dewitz	McGraw Hill
9	System analysis & Design Methods	Whitten, Bentley	TMH. 2007

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Paper No : 505 **L: 4 Hrs**
Paper Title: Operating System **Credits: 4**

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1 **Operating System Concepts**

1.1 Evolution of Operating System
1.2 Needs of an Operating System
1.3 Elements of an Operating System
1.4 Types of O.S.: Single User & Multi-User, Batch, Multi-Programmed, Time-Sharing, Real-Time, Distributed, Parallel, Mobile
1.5 Operating System Structure: Layered System, Microkernel and Virtual Machine

2 Process Management

2.1 Process concept
2.2 Process State Model
2.3 Process Scheduling
    2.3.1 Scheduling Criteria
    2.3.2 Scheduling algorithms
2.4 Thread and Multithreading
2.5 Inter-process Communication
2.6 Process Coordination
    2.6.1 Critical Section problem
    2.6.2 Semaphores
2.7 Deadlocks
    2.7.1 Deadlock Characteristics
    2.7.2 Deadlock Prevention, Avoidance
    2.7.3 Deadlock Detection, Recovery

3 Memory Management

3.1 The notion of physical and logical address space
3.2 Contiguous allocation
3.3 Non-Contiguous allocation
    3.3.1 Paging
    3.3.2 Segmentation
3.4 Other Memory Management Schemes: Swapping and Overlays
3.5 Demand Paging & Demand Segmentation
3.6 Allocation of frames & Page Replacement policies
3.7 Implementation in various operating systems

4 Device Management

4.1 Device Characteristics
4.2 I/O Hardware
4.3 Application l/O Interface
4.4 Kernel I/O Subsystem

4.5 STREAMS
4.6 Mass Storage Structure
    4.6.1 Disk Structure
    4.6.2 Disk scheduling
    4.6.3 Disk Management
4.7 Implementation in various operating systems

5 File System Management

5.1 File Concept: File Types and File Operation
5.2 Directory Structure
5.3 Directory Implementation
5.4 File-System Implementation
5.5 Allocation Methods
5.6 Free-Space Management
5.7 File-System Mounting, File Sharing and Protection
5.8 Implementation in various operating systems

6 Protection & Security

6.1 Protection
    6.1.1 Goals of Protection
    6.1.2 Domain of Protection
6.2 Security Problem
    6.2.1 User Authentication
    6.2.2 Cryptography as Security Tool
    6.2.3 Program Threats
    6.2.4 System and Network threats
    6.2.5 Various Preventive Measures

References:

1	Operating Systems Concepts	Galvin Silberschatz	McGraw Hill
2	Operating Systems	William Stallings	PHI
3	Modern Operating Systems	Andrew S. Tanenbaum	Pearson Edu./PHI
4	Unix Concepts And Application	Das	McGrawHill
5	Operating System	Dhamdhere	TMH
6	Understanding Operating System	Ida Flynn	Brookes/Cole
7	Operating System	P Balakrishna Prasad	Scitech

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Paper No : 506 **P: 10 Hrs**

Paper Title : Practical. **Credits: 5**

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

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Semester VI

Teaching and Evaluation Scheme

Course Code	Course Type	Course Name	External Marks	Internal Marks	Total Marks	Contact Hours	Credits	External Exam Duration
601	CORE	JAVA	70	30	100	4	4	3
602	CORE	Linux Administration and Shell Programming	70	30	100	4	4	3
603	CORE	Web development-II	70	30	100	4	4	3
604	CORE	Project	140	60	200	16	8	--
605	CORE	Practical	140	60	200	10	5	5
		TOTAL	490	210	700	38	25	-

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Paper No. : 601 **L: 4 Hrs**
Paper Title : Java **Credits: 4**

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1. Introduction to java and its Tool Chain
2. Basics of Java Programming
3. APIs dealing with String, Math, Date and general utilities
4. Object Oriented Programming in Java

4.1 Basics
4.2 Inheritance
4.3 Chaining constructor using this() and super()
4.4 Garbage Collection
4.5 Interfaces

5. Exception Handling

5.1 Exception and error classes
5.2 Exception handling
5.3 throw statement and throws clause
5.4 Custom exception

6. Multithreaded programming

6.1 Overview of threads
6.2 Creating threads
6.3 Multithreaded programs
6.4 Synchronization
6.5 Deadlock
6.6 thread communication
6.7 Fork and Join

7. Java I/O

7.1 Files and directories
7.2 Character streams
7.3 Buffered character streams and byte streams
7.4 PrintWriter class
7.5 Input and Output streams
7.6 Random access files
7.7 Serialization and Deserialization

8. Java packages

8.1 Collections and maps
8.2 Utility classes

9. Annotations

10. Abstract window toolkit

10.1 AWT Components
10.2 Layout managers

11. Event handling

11.1 Delegation model
11.2 Event classes and listeners
11.3 Adapter classes
11.4 Annonymous inner classes

12. Introduction to Applets

12.1 Applet Basics
12.2 Life Cycle of Applets
12.3 Creating and Using Applets
12.4 the HTML APPLET Tag
12.5 Passing Parameters to Applet
12.6 The AudioClip Interface
12.7 Sandbox Security in Applets
12.8 Use of policy tool for configuring security in applet

13. Java beans

13.1 Basics of Java Beans
13.2 Introspection Properties and events
13.3 Using Bound Properties
    13.3.1 Steps
    13.3.2 Using the Bean Info Interface
13.4 Constrained Properties
13.5 Persistence
13.6 Customizers
13.7 Custom event delegation and listeners
13.8 Reflection

14. An Introduction to JDBC

*Note : The above syllabus will be in synchronization with the current version of Java.

References:

1	Java The complete reference	Schildt, Herbert	TMH
2	Java Platform	Jaworski, Jamie	Techmedia
3	Java developers handbook	Heller, Phili & Roberts,Siman	BPB
4	Core Java for Beginners	S. Shah, V. Shah	SPD
5	Java programmers reference	Palmer,Grant	WROX

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Semester VI

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

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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, egrep 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

References:

1	Your UNIX the ultimate Guide	S. Das	TMH
2	The UNIX Programming Env.	Kernigh & Pike	PHI
3	UNIX Shells – Bourn, Korn & C	Vijay Mukhi	BPB
4	Linux Administration Handbook	Nemeth, Snyder, Hein	Pearson Edu
5	Shell scripting	Forouzan	-
6	The complete reference Linux	Richard Peterson	TMH
7	C & UNIX Programming	N Kutti	-
8	Working with UNIX	Vijay Mukhi	BPB
10	Linux in a nutshell	Elen, Figgins	O'reilly
11	Linux Complete Reference	-	-

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Semester VI

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

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. Introduction to JQuery

10. Introduction to Templates and MVC Frameworks

9.1 Templating systems: PHP itself
9.2 Smarty
9.3 Introduction to PHP frameworks and libraries: CodeIgniter, CakePHP etc

11. Web Development with Ruby

Ruby - variables, objects and classes, scope, language constructs, control flow

12. Rails Framework

Introduction, MVC (Model, View, Controller) and How to install Rails, Building an Application, Database Integration, Active Record, Action Controller, Action View, Securing, Scaling, Deployment

References:

1	PHP Bible	Tim Converse	Joyce Park
2	PHP Cookbook	David Sklar and Adam Trachtenberg	O'Reilly
3	Programming PHP	Rasmus Lerdorf, Kevin Tatroe	O'Reilly
4	Beginning Ruby: From Novice to Professional	Peter Cooper	Apress
5	Ruby on Rails: Up and Running	Bruce A. Tate, Curt Hibbs	O'Reilly
6	Programming PHP	Rasmus Lerdorf and Kevin tatroe	O'Reilly
7	PHP 5 and MySQL	Tim converse, Joyce Park and Clark Morgan	Bible Wiley

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Paper No	**: 604**	**P: 16 Hrs**
Paper Title	**: Project.**	**Credits: 8**

The students are required to carry out project work during the semester preferable in industry.

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Paper No	**: 605**	**P: 10 Hrs**
Paper Title	**: Practical.**	**Credits: 5**

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