

No.UG/ 218 of 2010
Mumbai - 400 032
28th June, 2010.

The Head,
University Department of Physics,
Vidyanagari Campus,
Kalina, Santacruz (East),
Mumbai - 400 098

Sir,

I am to invite your attention to the Ordinance, Regulations and Syllabus relating to the Post-Graduate Diploma course in Information Technology (PGDIT) vide this office Circular No.UG/406 of 2007 dated 10th October, 2007 and to inform you that the recommendation made by the Board of Studies in Physics at its meeting held on 30th November, 2009 has been accepted by the Academic Council at its meeting held 3rd March, 2010 vide item No.4.1 and that, in accordance therewith, the syllabus of Post-Graduate Diploma course in Information Technology (PGDIT) is revised as per Appendix and that the same has been brought into force with effect from the academic year 2010-2011.

Yours faithfully,

Sd/-

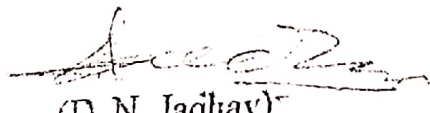
L. R. MANE
Offg. REGISTRAR

3/3/10
AC/4.1/10/06/2010

No. UG/218-A of 2010, MUMBAI-400 032 28th June, 2010

Copy forwarded with compliments for information to:-

- 1) The Dean, Faculty of Science,
- 2) The Chairman, Board of Studies in Physics
- 3) The Controller of Examinations,
- 4) The Co-Ordinator, University Computerization Centre,


(D. N. Jadhav)
Ag. Deputy Registrar
(UG/PG Section)

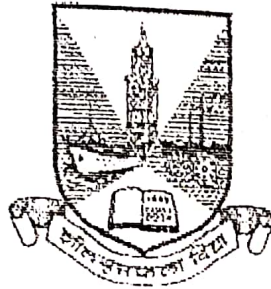
Copy to :-

The Director, Board of College and University Development, the Deputy Registrar (Eligibility and Migration Section), the Director of Students Welfare, the Executive Secretary to the Vice-Chancellor, the Registrar and the Assistant Registrar, Administrative sub-center, Ratnagiri for information (2 copies), Record Section (5 copies).



03.03.2010

UNIVERSITY OF MUMBAI



**Revised Syllabus
For
Post Graduate Diploma
In
Information Technology
(PGDIT)**

(with effect from the academic year 2010 - 2011)

Semester I

Paper I: Network Integration and Data communication Hardware

SECTION I: Networking Fundamentals

(30 Hrs) 50 %

Types of Network: LAN, WLAN, WAN, MAN, SAN, CAN, PAN, DAN, GAN;
Network Architecture: Client/Server, Peer to Peer, 3-tier, N-tier, Clustered, Space-based;
Network Topologies: Bus, Ring, Star, Tree, Mesh; Network Medium: Twisted Cables, Coaxial Cables, Wireless (Infra red, Radio, Microwave, Satellite) Media Communication Protocols: Ethernet (802.3), Fast Ethernet, AppleTalk (Deprecated by Apple in favor of TCP/IP), CSMA/CD, Token Ring, ARCnet, FDDI (802.4), ATM, Wireless Ethernet (802.11); Network Protocols: TCP/IP, OSI Model, NetBIOS; Networking Devices: Network Card, Repeater, Hub, Bridge, Switch, Gateway, Router, Multilayer Switch, Brouter, Protocol Converter, Proxy, Firewall, Multiplexer, Modem, ISDN Adapter, Trans-receivers; Network Adapters: Choice, Special-purpose NIC, Wireless Adapters, Remote Boot Adapters, NIC Drivers; Network Services: Authentication, Directory, DHCP, DNS, E-mail, Printing, Network File System; Network Designing: IP Addressing (IPv4, IPv6), Requirement planning, Scalability, Availability, Performance, Security, Recoverability, Resiliency, Adaptability, Manageability, Usability, Cost-effectiveness, Technology, Capacity, Physical layout, QOS, 5-4-3-2-1 Rule; WAN Technologies: X.25, ISDN, PPP, ATM, Frame Relay, FDDI, SONET, SMDS, DNS, MPLS, SMTP, POP3, SNMP; Channel Access Methods: Circuit Switching, Packet Switching, FDMA, TDMA, CDMA, FDD, TDD, GSM, GPRS, WCDMA, SDMA, 3G (EDGE, CDMA2000), 4G; Network Models: Distributed, Enterprise, VLAN.

(30 Hrs) 50 %

SECTION II: Network Integration

Network Architectures Ethernet ;Token Ring ,How Token Ring Works, Beaconsing, Hardware Components, Cabling in a Token Ring Environment. FDDI, Other Networking Alternatives. Simple Network Operations: Network Operating Systems, Software Components of Networking, General NOS Components; Client Network Software, Server Network Software, Client and Server, Installing a Network Operating System, Installing Microsoft Windows Servers,. Understanding Complex Networks; Interconnectivity in Multivendor Environments, Implementing Multivendor Solutions, Centralized vs. Client/Server Computing, Client/Server Environment. Network Administration and Support: Managing Networked Accounts, Managing Network Performance ;Managing Network Data Security; Avoiding Data Loss. Solving Network Problems; Preventing Problems with Network Management and Planning; Backing Up Network Data; Setting Security Policies; Setting Hardware and Software Standards; Establishing Upgrade Guidelines; Maintaining Documentation; Performing

Network Support Resources: Microsoft TechNet, Microsoft Knowledge Base. Server Hardware Requirements, Specialized Servers, Selecting the Right Type of Network, Cable Selection Criteria, The IBM Cabling System; Wireless Networking: Intangible Media; The Wireless World, Types of Wireless Networks, Wireless LAN, Applications, Wireless LAN Transmission, Wireless Extended LAN Technologies, Microwave Networking Technologies. High-speed Wireless Networking Technologies. VLANs Introduction Basic Configuration VLANs, DHCP, Configuring the Switch Using the Console Interface, User Accounts Management Configuration, Network Monitoring, Port Utilization, Browse MAC Address Switch History, IGMP Snooping, Dynamic Group Registration Table, VLAN Status, Web-Based Network Management Configuration IP Address, Port LACP Trucking, IGMP Snooping, Port GMRP, MAC Address, IGMP Snooping, Dynamic Group Registration, TFTP Service 141, RJ-45 Pin Specification, Runtime Switching Software Default Settings, Understanding and Troubleshooting the Spanning Tree Protocol.

Experiments on Networking-

- 1) Understanding color code of twisted cable
- 2) Crimping RJ-45.
- 3) Conversion of Numbers:
Binary, Octal, Hex to Decimal and Vice versa.
- 4) Configure IP Address scheme in a Network.
- 5) Subnetting – Masking, Submasking etc.
- 6) Setting up network of Star Topology.
- 7) Switching using network Simulator (Boson 6.0).
- 8) Routing using network Simulator (Boson 6.0).
- 9) V-LAN Configurations using network Simulator (Boson 6.0).
- 10) Setting and Configuring Network devices using Manageable switches.

References-

1. Guide to Networking Essentials: Ed Tittel and D. Jhonson; Thomson Learning, 5th Edition, 2007
2. Computer Networks : Andrew S. Tanenbaum , PHI.
3. Data & Computer Communications By William Stallings (PHI) 5th Edition
4. Data communication and networking- Forouzan (TMH), 2006
5. <http://www.windowsnetworking.com>
6. <http://www.jegsworks.com/lessons/>
7. <http://www.edrawsoft.com/Network-Diagram-Examples.php>
8. [http://technet.microsoft.com/hi-in/library/default\(en-us\).aspx](http://technet.microsoft.com/hi-in/library/default(en-us).aspx)
9. <http://www.greyfriars.net/gcg/greyweb.nsf/miam/courseoutline>

SECTION I : LINUX Operating System

Introduction to GNU/LINUX, How to obtain and install GNU/Linux, basic commands and X-windows, File System Partitions, Installation, Boot Loader GRUB. 50 %

Networking & Server setup: Configuring GNU/Linux as Network Server, Setting up Web server using Apache software, DNS server, SQUID, Proxy, Mail server, telnet, SSH and FTP server, Shell Programming in Linux, System administration, Linux text editor vi/vim or Emacs Editor.

Applications: KDE, GNOME, GIMP, RPM and apt-get, Mozilla, Nautilus, Konqueror, Open Office, K office, Abiword, gnumeric etc.

Experiments on Linux operating system

- 1) Installing Ubuntu on the computers and configuring dual booting. The hardware configuration across entire lab and test comp which is connected to projector is almost identical. Students watch each step, take a note, and do it on the comp.
- 2) Navigating the File System. What is /bin, /etc, /usr, /var....
- 3) Installing additional packages and adding mirrors.(Using Synaptic only)
- 4) Important files and directories.(like /etc/passwd, /etc/fstab, /etc/inittab etc.) Contents of /proc, /var/log
- 5) Shell commands: starting from how to create/copy/delete directories from shell and viewing the effects graphically with nautilus.
- 6) Shell commands: Demonstrating selected simple commands from /bin, /usr/bin (ls, less, more, cal, date, df, uname, arch, cat, echo etc.)
- 7) I/O redirections, Pipes. More complex commands like (tail -f, top, cut).
- 8) Creating simple shell script which prints system status like date, logged in users, disk usage etc.
- 9) Installing packages. Using apt-get. Adding mirrors to sources. list. Using dpkg.
(assignment-: Install KDE on their desktop)
- 10) Means of communication: Using talk, write, wall, local mail.
- 11) Basic System Administration: passwd, shadow, group files. Managing users, groups, shells, homes.
- 12) Files access permissions: Using chmod, chown, chgrp. Understanding the concept of 777/rwx digits.

- 13) Processes, PIDs, /proc, kill signals.
- 14) Understanding Devices and the fstab file, inittab System runlevels, grub and its menu.list. Installing cron files.
- 15) Basic Networking Concepts: Need for IP addresses and networks. How to configure ip address, gateway and DNS for a standalone computer (ipconfig, route, /etc/resolv.conf). Explain need for domain names and DNS records.
Types of DNS records and how to query them(host, dig)
- 16) Installing simple daemons : Apache, Bind. Viewing simple html pages from webserver.
- 17) Editors: How to do simple editing operations in nano, vi, emacs.
- 18) Emacs: Creating macros, abbreviations, emacs settings.
- 19) Free Software Philosophy, GNU Project.
- 20) Review of all the topics covered in the semester.

References-

- 1) Red Hat Linux 6 Unleashed : David Pitts, Bill Ball, Techmedia.
- 2) Sams teach yourself Linux in 21 days. (Pearson)
- 3) Linux- The complete reference- Richard Peterson (Osborne Mcgraw- Hill)
- 4) Learning Debian GNU/Linux- O'Reilly
- 5) Linux in Nutshell- O'Reilly (Shroff Publishers)
- 6) www.linux.com
- 7) www.reallylinux.com

SECTION II : WINDOWS 2003 Operating System

50 %

Installation of Windows 2003, Configuring & managing Active Directory Services
Adding Clients to Windows 2003, Managing Users, Computers, and Groups, Managing and Maintaining Access to Resources, Managing and Maintaining a Server Environment
Managing and Implementing Disaster Recovery, Configuring DHCP, Configuring DNS.
Configuring IIS.

Experiment in Window 2003

- 1) Installation of Windows 2003 server and Windows XP
- 2) Installing Device Drivers, Services, Hardware, Logical Drivers, Software, Database, etc
- 3) Configuring & Managing Active Directory Services (Domain Controller)
- 4) Adding Clients to Windows 2003 domain
- 5) Managing domain's Users, Computers, and Groups

- 6) Managing and Maintaining Access to Resources in the domain (Hardware, Network, File, Programs)
- 7) Managing and Maintaining a Server Environment
- 8) Managing and Implementing Disaster Recovery (Backup, Recovering from System failure, etc)
- 9) Configuring DHCP (Automatic allocation of IP address, setting up policies, etc)
- 10) Configuring DNS (Domain name, Registering IP Address, Setting client DNS discovery, etc)
- 11) Configuring IIS (Configure Web service, Creating web site, Accessing Website from network, etc)

References-

- 1) Microsoft press books on windows 2003 /Window XP
- 2) Learning Windows Server 2003, 2nd Edition By Jonathan Hassell (O'Reilly)
- 3) Microsoft® Windows® Server 2003 Delta Guide By Don Jones, Mark Rouse (SAMS)
- 4) <http://technet.microsoft.com/en-us/library/default.aspx>

Paper III : Object Oriented Programming & Database Concepts

SECTION I. : Object Oriented Programming

50 %

Introduction to Computer Programming, Introduction To C++, Expressions and Interactivity, Making Decisions, Looping, Functions. Arrays, Sorting and Searching Arrays, Pointers, Characters and Strings, Structured Data, File Operations, Classes, Inheritance and Polymorphism, Exception, Templates and the Standard Template Library, Recursion.

Experiments in C++

Writing Programs on

- 1) Operations and Expressions
- 2) Making Decision
- 3) Looping
- 4) Arrays and Strings
- 5) Modular programming with functions
- 6) Class and Objects
- 7) Operator Handling
- 8) Inheritance
- 9) Exception Handling

Reference-

- 1) Starting out with C++, Tony Gaddis, Penram International Publishing(India).2006
- 2) Object Oriented Programming with C++ : E. Balaguruswamy(TMh)

SECTION II.

Database Concepts:

50 %

Introduction to Oracle (internet based), Data types and In-built functions, Introduction to SQL, Data Correlation, An introduction to PL/SQL, Triggers, Procedures, Oracle OOP Concepts, Writing basic SQL select statements, Restricting and Sorting data, Single row functions, Displaying data from Multiple tables: Joins and Sub-Queries, Aggregating data using group functions, Producing readable output with iSQL* plus, Manipulating data, Creating and Managing tables, Including constraints, Creating view ,Other Database Objects, Controlling User Access.

Experiments in Oracle-

- 1) Creating and Displaying table Information.
- 2) Dropping, Renaming, Truncating Table
- 3) Working with Table: Data management and retrieval
 - a) Adding, Updating, deleting existing rows/ records
 - b) Use of constraint
- 4) Built-in Function using Single row and group function.
- 5) Grouping data using HAVING Clause
- 6) Restricting data with a WHERE clause
- 7) Multiple tables- joints and Sub-queries
- 8) Assignments on Data base Objects-
 - a) View
 - b) Sequences
 - c) Synonyms
 - d) Index
- 9) Generating Report
- 10) PL- SQL Programming

References-

- 1) Oracle -9i The Complete Reference.-Oracle Press.
- 2) Oracle -11i The Complete Reference.-Oracle Press.
- 3) SQL/PLSQL – Ivan Bayross (BPB)

Paper IV : JAVA Programming & Applications

JAVA Programming :

SECTION I

50%

Introduction to JAVA, Object Oriented Programming in JAVA, Overview of JAVA language, Constants, Variables and Data types, Operators and Expression, Control Statements, Object and Classes in JAVA, Arrays, Strings and Vectors, Multithreaded Programming, Inheritance, Packages and Interfaces, Exception Handling, JAVA Applets Programming and Applet API, JAVA graphics programming, Creating JAVA User Interface, I/O and applets, Introduction to AWT, Networking with JAVA.

Experiments in Java-

- 1) Declaration, initialization, scoping
- 2) Declare ,Initializes, uses of primitives and arrays
- 3) Flow control-(code that implement IF or SWITCH ,all forms of loops)
- 4) Use of exceptions and exception handling clause(Try, catch etc)
- 5) Programs on Interface and Packages
- 6) Programs on Garbage collection
- 7) Programs on Inheritance
- 8) Programs on Applets
- 9) Socket Programming
- 10) Use of Access specifiers.

Reference-

- 1) The Complete Reference –Java 7th Edition- Schildt (TMH)2008
- 2) Core – Java fundamentals – Horstmann cornell(SUN)
- 3) Programming with Java 3e-A primer-E. Balguruswamy (Mcgrow Hill)2008

SECTION IIA

J2EE

25 %

Introduction to J2EE and Enterprise Java Beans, J2EE Platform and Application, JDBC, RMI, Servlets Programming, Java Server Pages, Filters for Web Applications, JSP Applications, J2EE Security, Web Services and Web Service Registries.

Experiments in J2EE-

- 1) Configure Web Servers and Environmental Variables
- 2) Programs on Servlet application (Simple & Advance)
- 3) Programs on JSP application
- 4) Programs on Filters with Servlets and JSP
- 5) Programs on Servlet Chaining
- 6) Programs on application of Security on Web Server
- 7) Programs on RMI application
- 8) Programs on Servlet connectivity with Database through JDBC
- 9) Programs on EJB 3.0
- 10) Programs on Java Web Service

References-

- 1) Servlets and Java Server Pages: The J2EE Technology Web Tier By Jayson Falkner, Kevin Jones (Addison Wesley)
- 2) J2EETM Web Services By Richard Monson-Haefel (Addison Wesley)
- 3) Mastering Enterprise JavaBeans 3.0 By Rima Patel Sriganesh, Gerald Brose, Micah Silverman (Wiley)
- 4) J2EE in 21 days.(Sams teach yourself) –Pearson Education
- 5) Professional Java Server prog. J2EE1.3 Edition- (A press)-S. Allamaraju et.al
- 6) <http://java.sun.com/developer/onlineTraining/tools/>
- 7) <http://www.netbeans.org/kb/trails/java-ee.html>
- 8) <http://www.netbeans.org/kb/60/java/quickstart.html>
- 9) http://java.sun.com/developer/onlineTraining/tools/netbeans_part1/
- 10) <http://www.coreservlets.com/Apache-Tomcat-Tutorial/>

SECTION II B. J2ME Introduction to Wireless Applications & Devices 25%

WAP & I- Mode, J2ME, Hardware Requirements, MIDP / CLDC / KVM ,Installing the J2ME Toolkit, J2ME Programming ,CLDC Libraries, MIDP Libraries, MIDLET and MIDLET Suites, Create your first Wireless Application, CLDC Limitations, Security in J2ME,Package and Deployment, Advanced J2ME Programming ,UI for Wireless Devices, AWT in MIDP, Using the Canvas Class, Graphics and Drawing in J2ME, Persistent Storage, Network programming in Java, Using XML in J2ME.

Experiments in J2ME-

- 1) Installation of J2ME toolkit
- 2) Compiling running and Deploying Hello world in J2ME style
- 3) Use of Multiple MIDlets in a MIDlet suite.
- 4) Building and Running a project in GUI (J2ME wireless toolkit.)
- 5) Programming on AWT in MIDP
- 6) Programs on using Canvas Class
- 7) Programs on Graphics and Drawing.

References-

- 1) The Complete Reference J2ME –James Keogh [TMH].

Paper V : Web Programming Technology

SECTION- IA

ASP.NET,XML,HTML

25 %

Introduction to ASP.NET, ASP.NET Framework, Web Forms, Programming & HTML Scripting, VBScript, Creation of ASP.Net Applications, XML & HTML tags, Cascading Style Sheets, Server & custom controls, difference between ASP & ASP.NET, Data Binding, Server Control templates, Accessing & manipulating data from database, ADO & Data Connectivity with SQL server & Database Applications.

Experiments on ASP.NET

- 1) Prepare a webpage for the university website which is ' About University' webpage with 5-10 lines text. Write the HTML code for this.
- 2) Password Form
- 3) Prepare a web page/ pages to demonstrate the tags. Big, small , bold, italics, underline, subscript, superscript etc
- 4) Prepare a web page to demonstrate
the Marquee tag, Order –Unordered list.
Hyperlink to string connecting e-mail id, URL
Hyperlink to image connecting to an e-mail id, URL
- 5) Create a Table
- 6) Frame set
- 7) Use of Functions
- 8) Connectivity with ASP. Net Environment

References-

- 1) ASP.net 2.0 with VB 2005 –Anne Boehm, Doug Lowe (Murach)
- 2) Programming ASP.NET : O'REILLY , By Jesse Liberty & Dan Hurwitz

PHP & MySQL

25 %

SECTION- IB

Introduction to PHP, History of web programming; how PHP fits into the web environment; installation and configuration; "Hello World"; syntax, variables, operators, flow control structures. Language reference; Basic syntax, types, variables, expressions, operators, control structures, functions, exceptions. More language basics; using GET and POST input, working with HTML forms; built-in and user-defined functions; variable scope; using the PHP manual, getting help. Input validation, string manipulation and regular expression functions; date and time functions. Code re-use, require(), include(), and the include path ; file-system functions and file input and output; sending mail. Introducing MySQL; database design concepts; the Structured Query Language (SQL); Communicating with a MySQL backend via the PHP MySQL API.

Experiments in PHP & My SQL

- 1) Installation and Configuration.
- 2) Learning basic syntax, writing first programme.
- 3) Programs on Operators, Control Structures, functions, exceptions.
- 4) Programs using GET and POST input.
- 5) Working with HTML Forms, built-in and User defined functions
- 6) Programs using code re-use, require(), and other filesystem functions.
- 7) Designing and managing Database using MySQL
- 8) Communicating with MySQL backend via the PHP MySQL API.

References:

- 1) PHP in Nutshell : A desktop Quick reference- Paul Haudson –O'reilly
- 2) The PHP Manual - <http://www.php.net/manual/en/>
- 3) Sams teach yourself MySQL in 21 days
- 4) Head First PHP & MySQL – Lynn Beighley & Morrison - O'reilly

SECTION II:

Introduction to Visual Studio.NET, Visual Studio.NET IDE, Windows Forms, Data types, Operators, Creating a Class, ADO.NET, connecting to a Database, Data Binding, Filtering, Sorting, Data from multiple tables with SQL server, Creating reports, GridView, Crystal Reports, Charts, Menus and MDI Applications, File I/O, Exception Handling and debugging, Components & User controls, Web services & Deploying VB.Net Applications.

Experiments on VB.NET

- 1) First VB.NET Form, Textbox With "Hi ! This Is My First V.B. .Net Form" String .
- 2) Students Enquiry form.
- 3) PASSWORD Form
- 4) Score Display form (century, double century, triple century) using if-else, select-case.
- 5) Result Display Form (Accept the marks for Eng, Maths, Sci. & Display the class obtained).
- 6) While-End-While structure form.
- 7) Do-Loop structure form.
- 8) For-Next structure form.
- 9) NESTED CONTROL Statement form.
- 10) ByRef & ByVal parameters in Procedure form (Using variable M, N).
- 11) Calculate monthly salary from Annual Salary with .Net Form.
- 12) Background & Foreground color Change for the text in textbox with colorDialog box.
- 13) Background & Foreground color Change for Label with colorDialog box
- 14) Write a program to print prime Numbers less than 20 in VB.NET and display those with msgbox.
- 15) Write a program to accept three Numbers less than A, B, C, and display those in ascending order with Labels on the at runtime.
- 16) Write a program to print even Nos. up to 15 and display with msgbox.
- 17) Write five statement about your V.B. . Net Course into the file c:\temp\myvbfile.txt.
- 18) Create 5 records in SQL tale with minimum five fields and check those with data tracking program with SQL connectivity.
- 19) In above table, Add, delete and Updates some records with data maintenance with SQL Connectivity.

References-

- 1) Murach's ADO.Net 2.0 database programming with VB 2005-Anne Bohem
- 2) Complete reference VB 2005 by Petrusha -(TMH)
- 3) Visual Basic .NET Programming (Black Book) By Steven Holzner

Paper VI : E-Commerce

SECTION I.

E-Business:

50 %

Introduction, Internet and Intranet-Based E-Commerce, Network Infrastructure for E-Commerce, Broad-Band Telecommunication, Mobile Commerce/Mobile Computing Wireless Application Protocol, E-Commerce and Web Security, Network Security, Transaction Security Virtual Private Networks, Electronic Payment Systems, Online Banking, EDI and its Applications, E-Commerce Laws and Forms of Agreements, Role of Government in Electronic Commerce, Supply- Chain Management in E-Commerce, Customer Relationship Management.

References-

- 1) E- Commerce Ritendra Goel, (New Age) 2007
- 2) E-Commerce-Fundamentals & Applications: H.Chan, R.Lee, et.al
- 3) eBusiness A Beginner's Guide- Robert C. Elsenpeter & T.Velte(TMh)

Experiments on E-commerce.

1)Analyzing ,understanding the following websites from E-commerce Point of view and making presentation on it.

- 1) www.echaupal.com
- 2) www.amazon.com
- 3) www.ebay.com
- 4) www.dhrishti.com

SECTION II.

Software Engineering:

50%

System and software requirement analysis, Introduction to System analysis and design: various life cycles models, Software quality assurance: various techniques, RISK management. Software metrics, ISO, CMM and other quality approaches, Software testing techniques. software testing strategies, S/w project estimation Project planning with MS project and tracking, Software quality management. Metrics AND Measurement, Business aspect of S/E with focus on Management Information system (MIS), Decision Support system(DSS) & Expert Information system(EIS).

References-

- 1) Object Oriented Software Engineering; Bruegge, Dutoit;PHI
- 2) Management Information Systems - James A O' Brian (TMH)
- 3) Software engineering Theory and Practice-Shari ,(Pearson Education)

Experiments on Software Engineering

- 1) Forming an Event –List.
- 2) Forming Context Level Diagram
- 3) Drawing Data flow Diagram
- 4) Study of Software Development Life –Cycle.
- 5) Study of different software engineering models

PROJECTS-

The broad categories in which the various projects can be carried out are as follows:

Sr. No	Topics
1	Network Integration
2	Network Security
3	Network Protocols
4	Data Integration
5	Database security
6	Database Backup
7	Website Development
8	Internet Applications
9	Software Development
10	Portal Development

Paperwise List of some suggested or most probable projects are also given below.

Paper – I

- 1) Creating integrated WAN, LAN, WLAN network solution using Router, Switch, Client, Server.
- 2) Creating a VLAN network solution using Router, Switch, Desktop, etc.
- 3) Optimize network performance by LACP, VLAN, Security, etc.

Paper -II

- 1) Setting up server in the network environment which includes installation of OS, Device Drivers, Services, Active Directory, DNS, DHCP & Adding Clients & users.
- 2) Managing O.S in Network environment: Managing Users, Groups & Computers, Managing policies, Maintaining server Environment, Disaster recovery.
- 3) Configure Web Service: Installing & Configuring IIS, DNS, DHCP services, Creating a web site, Connecting to the default web page of the website from network.
- 4) Web security using SQUID proxy server.

Paper- III

- 1) Accounting System
- 2) Payroll Process
- 3) College admission Process.

Paper- IV

- 1) Developing web based business model using Java Servlets & Database
- 2) Developing a web based secure banking software using Java Servlet/JSP, Database, J2EE security, J2EE Filters
- 3) Developing EJB based business model using EJB & Database.
- 4) Developing E-GAMES, puzzles etc

Paper- V

- 1) Developing an On-line Ticket reservation system.
- 2) Inventory Management.
- 3) Library Management System.
- 4) Housing society maintenance System.
- 5) Invoicing system.

Paper VI

- 1) Developing an On-line shopping Portal.
- 2) Net Banking

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