Programme : Diploma in Computer Engg/Information Technology
Programme Code : 06 / 07
Name of Course : Advanced Java Programming
Course Code : CM761
Pre-Requisite : CM563(Java Programming)

Teaching Scheme:

	Hours /Week	Total Hours
Theory	04	64
Practical	02	32

Evaluation Scheme:

	Progressive Assessment	**Semester End Examination**			
		Theory	**Practical**	**Oral**	**Term work**
Duration	**Two class tests , each of 60 minutes**	**3Hrs.**	**--**	**--**	**--**
Marks	**20**	**80**	**25**	**--**	**25**

Course Rationale:

In the Era of Web technology it is essential for every Diploma Engineering. To have knowledge of Internet programming. This course covers Advance JAVA as a programming language.

Course Objectives:

After studying this course, the student will be able to

- Create network based applications.
- Create business applications.
- Implement Server side programming.
- Develop dynamic software components.
- Develop database application.
- Design and develop powerful GUI based components.
- Create Animation using Applet, Thread and AWT controls

Course Content:

Chapter No.	Name of Topic/Sub topic		Hrs	Weigh tage
	SECTION-I			
1	**Event Handling and Introducing the AWT**:			
	1.1	Two event handling mechanisms, The delegation Event Model	**14**	**16**
	1.2	Event classes, Sources of Events, Event Listener Interfaces		
	1.3	Using the Delegation Event Model, Adapter classes, Inner classes		
	1.4	AWT classes, Window fundamentals, Working with frame Windows, Creating a frame Window in an Applet, Creating windowed program, Display information within with in a window,		
	1.5	Working with graphics, Working with color, Setting the paint mode,		
	1.6	Working with Fonts, Managing text output using Font Metrics, Exploring text & graphics		
	1.7	Control Fundamentals, Labels, Using Buttons, Applying Check Boxes, Checkbox Group, Choice Controls, Using Lists, Managing scroll Bars, Using a Text Field, Using a Text Area		
	1.8	Understanding Layout Managers, Menu Bars and Menus, Dialog Boxes, File Dialog		
	1.9	Handling events by Extending AWT Components, Exploring the Controls, Menus, and Layout Managers		
2	**JDBC and Swing component**:			
	2.1	Java as a Database front end Database client/server methodology Two-Tier Database Design Three-Tier Database Design The JDBC API The API Components Limitations Using JDBC (Applications vs Applets) Security Considerations A JDBC Database Example JDBC Drivers JDBC-ODBC Bridge Current JDBC Drivers	**12**	**12**

	2.2	Alternate connectivity strategies Remote Method Invocation (RMI) The common object request broker Architectures (CORBA) Connectivity to object databases Connectivity with Web based Database systems		
	2.3	The Tour of Swing : Japplet, Icons and Labels ,Text Fields, Buttons		
	2.4	Combo Boxes, Tabbed Panes, Scroll Panes, Trees, Tables, Exploring the Swings.		
3	**Networking basics**:			
	3.1	Socket overview, client/server, reserved sockets, proxy servers, internet addressing.	**06**	**12**
	3.2	interfaces Inet address Factory methods, instance method TCP/IP Client Sockets		
	3.3	What is URL Format URL connection TCI/IP Server Sockets		
	3.4	Datagrams Datagram packets Datagram server & client Net worth		
SECTION-II				
4	**JAVA Beans**			
	4.1	What is Java Beans? Advantages of Java Beans	**12**	**12**
	4.2	Application Builder Tools, The Bean Developer kit(BDK), JAR Files, Introspection, Developing a simple Bean Using Bound properties Using the BDK		
	4.3	Using Bound properties, Using the BeanInfo Interface, Constrained properties		
	4.4	Persistence Customizers, The Java Beans API, Using Bean Builder		
5	**Remote Method Invocation**			
	5.1	Introduction to Distributed Computing with RMI : Goals, Comparison of Distributed and Non distributed Java Programs	**08**	**10**
	5.2	Java RMI Architecture Interfaces: The Heart of RMI, RMI Architecture Layers, Stub and Skeleton Layer, Remote Reference Layer, Transport Layer		

	5.3	Naming Remote Objects, Using RMI, Interfaces, Implementation, Stubs and Skeletons, Host Server, Client		
	5.4	Running the RMI System, Parameters in RMI, Parameters in a Single Java Virtual Machine, Primitive Parameters, Object Parameters, Remote Object Parameters		
	5.5	RMI Client-Side Callbacks, Distributing and Installing RMI Software, Distributing RMI Classes, Automatic Distribution of Classes, Firewall Issues		
6	**Servlets**			
	6.1	Background: The Life Cycle Of a Servlet, Using the Tomcat For Servlet Development	**12**	**18**
	6.2	A Simple Servlet, The Servlet API, The Javax.Servlet Package, Reading Servlet Parameters, Reading Initialization Parameters		
	6.3	The Javax.Servlet.http package, Handling HTTP Requests and responses, Using Cookies, Session Tracking, Security Issues		
Total			**64**	**80**

List of Practicals/ Experiments/Assignments:

Sr. No.	Name of Experiment/Assignment	Hrs
1	Program to design a form using components textbox, text field, checkbox, buttons, listand handle various events related to each component.	02
2	Program to design a calculator using Java components and handle various events related to each component and apply proper layout to it.	02
3	Program to demonstrate use of - Grid Layout. - Flow Layout. - Card Layout. - Border Layout.	02

4	Program to display any string using available Font and with every mouse click change the size and / style of the string. Make use of Font and Font metrics class and their methods.	01
5	Program to create a menu bar with various menu items and sub menu items. Also create a checkable menu item. On clicking a menu Item display a suitable Dialog box.	01
6	An Application program /Applet to make connectivity with database using JDBC API	02
7	Application program/Applet to send queries through JDBC bridge & handle result	01
8	Program to design a form using basic swing components.	01
9	Program to demonstrate the use of scroll panes in Swing.	01
10	Program to map Directory tree.	02
11	Program to demonstrate the use of Tables.	01
12	Program to retrieve hostname using methods in Inet Address class.	01
13	Program that demonstrates TCP/IP based communication between client and server.	01
14	Program that demonstrates UDP based communication between client and server.	02
15	Program to demonstrate use of URL and URL Connection class for communication.	02
16	Program to develop simple bean using BDK (Bean Developing Kit)	02
17	Client/Server application using RMI	02
18	A servlet for demonstrating the genericservlet class.	02
19	A servlet to demonstrate the HttpServlet class using do Get ().	01
20	A servlet to demonstrate the HttpServlet class using do Post ().	01
21	A servlet to demonstrate the cookie.	02
	Total	**32**

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1	Event Handling and Introducing the AWT	Explanation's of basic concept
2	JDBC and Swing component	Explanation & Practical implementation
3	Networking basics	Explanation & Practical implementation
4	Java Beans	Explanation & Practical implementation
5	RMI	Explanation & Practical implementation
6	Servlets	Explanation & Practical implementation

Text Books:

Sr. No	Author	Title	Publication
1	Patrick Naughton-Herbert Schildt	The Complete Reference Java 2 (Fifth Edition)	Tata – Mcgraw hill

Reference Books:

Sr. No	Author	Title	Publication
1	Jaworski	Java 1.2 Unleased	Techmedia
2	Michael Morrison	The Complete IDIOT's Guide To JAVA 2	Prentice Hall of India
3	Keyur Shah	Java2 Programming	Tata McGraw hill
4	Cay S. Horstmann	Core Java Volume II	Pearson

Learning Resources: Books, Models

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
SECTION-I					
1	Event Handling and Introducing the AWT	04	03	07	14
2	JDBC and Swing component	04	03	07	14
3	Networking basics	06	04	04	14
SECTION-II					
4	JAVA Beans	04	04	04	12
5	RMI	06	02	02	10
6	Servlets	04	06	06	16
	Total	**28**	**22**	**30**	**80**

(Prof. J.R.Hange)
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(Prof. S.B.Nikam)
Chairman, PBOS

Programme : Diploma in Computer Engineering.
Programme Code : 06
Name of Course : Network Administration
Course Code : CM762
Pre-Requisite : CM564 (Advanced Computer Network)

Teaching Scheme:

	Hours /Week	Total Hours
Theory	**02**	**32**
Practical	**04**	**64**

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	**Practical**	**Oral**	**Term work**
Duration	**Two class tests of 60Min. duration**	**2 hrs.**	**---.**	**---**	**---**
Marks	**10**	**40**	**--**	**50**	**50**

Course Rational:

This course is aimed at providing the students with hands on Experience over Network Operating System: Windows 2003 Server, Configuring Server for Network Environment. It would expose students to administration and security issues in Network Environment. This course aims at implementation of Network Fundamentals covered in Computer Network I and II.

Course Objectives:

After studying this course, the student will be able to

- Install Windows Server 2003
- Configure networking resources
- Monitor network performance
- Troubleshoot network faults
- Manage disk quota
- Implement backup and recovery strategy

Course Content:

Chapter No.	Name of Topic/Sub topic		Hrs	Weightage
	SECTION – I			
1	**The Windows Server 2003 Environment :**			
	1.1	The Windows Server 2003 family and key features, Hardware requirements, Installation of Windows Server 2003. Architecture of windows server 2003,	06	06
	1.2	Installing and configuring, various peripheral devices and add on card drivers, Configuring Device Driver, Signing Options, Installing, configuring Administrative Tools		
	1.3	Implementing User, Group, and Computer Accounts : Creating User Accounts, Creating Computer Accounts, Modifying User and Computer Account Properties		
	1.4	Creating User Account Template, Managing User and Computer account Accounts		
	1.5	Managing Groups : Creating groups, Managing group membership, Strategies for using groups, Using default groups, Creating Global and Domain Local Groups.		
2	**Managing Access to Resources & Managing User Environment:**			
	2.1	File systems – FAT, Fat32, NTFS, Features of NTFS, Creating and Sharing Folders, Configuring NTFS Permissions, Publishing Shared Folders, Testing Permissions	06	06
	2.2	Manage access to files and folders by using NTFS permissions, Determine effective permissions, Manage access to shared files by using offline caching		
	2.3	Managing Group Policy :Configuring Group Policy Settings, Assigning Scripts with Group Policy, Restricting Group Membership and Access to Software Planning group policy strategy, creating		
	2.4	Group Policy Objects GPOs Group policy inheritance, Managing GPOs, Delegating Administrative control to GPOs Redirecting folders using group policy		

3	**Administrative Templates and Audit Policy :**			
	3.1	Using Account policy – password policy, logon policy, disk quota policy, account lockout policy, audit policy, Configuring Auditing ,	**06**	**08**
	3.2	Overview of Security in Windows Server 2003, Using Security templates to Secure Computers, Testing Computer Security Policy, Managing Security Logs, Creating a Custom Security Template, importing security Template		
	3.3	Managing Disks : Preparing Disks, Managing Disk Properties, Mounted Drives, converting Disks, Creating Volumes, Creating Fault-Tolerant Volumes, Importing a Foreign Disk, Initialize and partition a disk, Manage mounted drives, Convert disk from basic to dynamic and dynamic to basic		
SECTION - II				
4	**Windows Server 2003 networking & IP Routing:**			
	4.1	Defining a network infrastructure, basic terms – workgroup, domain, multiple domains, trust relationship. Active directory, remote access, name resolution, TCP/IP network infrastructure – network protocols	**04**	**06**
	4.2	IP address – the hierarchical addressing scheme, classification of IP address, Sub netting network, sub netting concepts – information hiding, sub netting TCP/IP networks, calculating number of subnets		
	4.3	Understanding IP routing, How routing works, Route tables, Types of routing – Static, Dynamic Routing information protocol, Open shortest path first protocol, Border routing		
	4.4	Multicast routing IP routing in Windows Server 2003 – Managing IP routing, creating and managing interfaces, Managing LAN Interfaces, Defining static routes.		

5	**Active directory & Domain Naming Systems :**			
	5.1	The active directory's logical structure, Benefits of active directory, Components and mechanisms in active directory –data store, Schema, Global catalog, replication .	**05**	**06**
	5.2	Overview of Active directory domains, transitive two way trust relationships, using multiple domains, active directory forest, active directory object names, active directory's physical structure, accessing active directory through LDAP		
	5.3	Understanding DNS, Domain naming, DNS and the internet, DNS and Windows Server 2003, Dynamic DNS, DNS Terminology , Working of DNS		
	5.4	Installation and configuration of DNS server, Creating DNS zones – forward lookup and reverse lookup zone		
6	**Dynamic Host Configuration Protocol , Backup and Recovery Strategy:**			
	6.1	Overview of DHCP, the DHCP lease process, Understanding scope details, Advantages and disadvantages of DHCP.Installing DHCP, authorizing DHCP for active directory, creating and managing DHCP scopes, managing reservations and exclusions, super scope, multicast scopes.	**05**	**08**
	6.2	Overview of Dial-up networking (DUN) and Virtual private networks (VPN) , Installing the remote access services, configuring RAS server. Managing RAS,Remote access security – user authentication, connection security, access control, Using remote access policies, Using remote access profiles.		
	6.3	Backup and Recovery Strategy :Planning backup and recovery strategy, using windows backup, Scheduling backup jobs, Backing up system state data, Using volume shadow copy, automated system recovery .		
		Total	**64**	**80**

List of Practicals/ Experiments/Assignments:

Sr. No.	Name of Experiment/Assignment	Hrs
1.	• Installation of Windows Server 2003/Windows 2000 Server/ Windows 2008 Server • Creation and Management of local users . • Creation and Management of group and implementation of its properties. • Installation of Device Drivers. • System Performance Monitoring through Windows Performance Monitoring.	**14**
2.	• Installation and implementation of Remote Desktop. • Sharing and managing Resources. • Creating various file Systems, and Configuring them. • Comparative study of FAT, FAT32, NTFS file systems	**08**
3.	• Creating login screen, Configuration of logon policies, password policy. • Implementation and study of Network Monitoring tool. • Testing, creating and importing security templates.	**08**
4.	• Configuration of TCP/IP network i) Assign IP Address ii) Verify IP Communication • Implementation of local, roaming, hardware profile.	**10**
5.	• Installation and verification of Active Directory i. Domain Controller ii. NetBIOS Domain Name iii. Permissions iv. Verifying the Installation • Event Viewer • Event Log • Installation of Domain Name System i. DNS Namespace ii. DNS Zones	**10**
6.	• Installation and implementation of DHCP i) Authorizing DHCP for Active Directory ii) Creating and managing DHCP Scopes	**14**

	• Management of Disk and Disk Quota entries i) Preparing Disk ii) Creating Volumes • Implementation of Backup and Recovery Strategy. • Writing batch scripts for administrative purpose.	
	Total	**64**

Instructional Strategy:

S.N.	Topic	Instructional Strategy
1.	The Windows Server 2003 Environment , Implementing User, Group, and Computer Accounts , Managing Groups	Introduction and Explanation, Demonstration
2	Managing Access to Resources, Managing the User Environment - Group Policy	Introduction and Explanation, Demonstration
3.	Administrative Templates and Audit Policy, Managing Disks	Introduction and Explanation, Demonstration
4.	Windows Server 2003 networking, IP Routing	Introduction and Explanation, Demonstration
5.	Active directory, Domain Name System	Introduction and Explanation, Demonstration
6.	Dynamic Host Configuration Protocol, Backup and Recovery Strategy	Introduction and Explanation, Demonstration

Text/Reference Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	Suzan Sage London, James Chellis	MCSE Windows Sever 2003 Nework Infrastructure Planning and Maintenance	BPB
2	Paul Robichaux, Matt Sheltz, James Chellis	MCSA/MCSE Windows Sever 2003 Nework Infrastructure Implementation, Management and Maintenance	BPB
3	Anil Desai, James Chellis	MCSE Windows Sever 2003 Active directory, Planning, Implementation and Maintenance	BPB
4	Jerry Honeycutt	Introducing Microsoft Windows Server 2003	PHI

5	Mark Minasi, Christa Anderson, Michele Beveridge,C.A. Callahan, Lisa Justice	Mastering Windows Server 2003	BPB

Learning Resources: LCD Projector ,Black Board and Online Demo.

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	The Windows Server 2003 Environment , Implementing User, Group, and Computer Accounts , Managing Groups	02	02	02	06
2.	Managing Access to Resources, Managing the User Environment - Group Policy	02	--	04	06
3.	Administrative Templates and Audit Policy, Managing Disks	02	02	04	08
4.	Windows Server 2003 networking, IP Routing	02	02	02	06
5.	Active directory, Domain Name System	02	--	04	06
6.	Dynamic Host Configuration Protocol,Backup and Recovery Strategy	02	02	04	08
	Total	**12**	**08**	**20**	**40**

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Programme : **Diploma in Computer Engineering /information Technology**
Programme Code : **06/07**
Name of Course : **System Programming**
Course Code : **CM763**

Teaching Scheme:

	Hours /Week	Total Hours
Theory	**04**	**64**
Practical	**02**	**32**

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests , each of 60 minutes	3Hrs.	--	--	--
Marks	**20**	**80**	--	**25**	**25**

Course Rationale:

System Programs are the set of software which aids in effective communication with the system and makes the user interface more friendly. This course is aimed in developing the knowledge about design aspects of such system software.

Course Objectives:

After studying this course, the student will be able to

- Understand various design aspects of the system Software.
- Develop software tools like editors and debuggers
- Develop various system software

Course Content:

Chapter No.	Name of Topic/Sub topic		Hrs	Weightage
	SECTION - I			
1	**Introduction**			
	1.1	Background , machine structure, Components of programming	**04**	**06**
	1.2	System : -Assemblers, loaders, Macros, Compilers, formal system.		
	1.3	Evolution of Operating System		
2	**Assemblers**			
	2.1	General design procedure, Design of the assembler, Statement of the problem	**12**	**12**
	2.2	, Data Structure, Format of databases, Algorithm (Detailed PASS 1& PASS 2 Flowchart),Look for modularity, Table Processing		
	2.3	**Searching** : Linear Search, Binary search		
	2.4	**Sorting:** Interchange sort, Shell sort, Bucket sort, Radix exchange sort, Address calculation sort, Comparisons of sort, Hash or Random entry searching.		
3	**Macro Language & Macro Processors**			
	3.1	Macro Instructions, Features of a Macro facility Macro Instruction Arguments	**10**	**10**
	3.2	Conditional macro expansion, Macro calls within Macros, Macro Instructions defining macros,		
	3.3	Implementation, Implementation of restricted facility		
	3.4	A two Pass algorithm, A single pass algorithm, Implementation of macro calls within Macros, Implementation within an assembler.		

4	**Loaders**			
	4.1	Introduction ,Loader Schemes, "Compile and go" loaders, General Loader Scheme, Absolute Loaders, Subroutine linkages	**12**	**12**
	4.2	Relocating loaders, Direct-linking loaders, Other loader schemes: Binders, Linking loaders, Overlays		
	4.3	Dynamic Binders, Design of an Absolute loader, Design of Direct Linking Loader,		
	4.4	Specification Problem, Specification of data structures , Format of databases. Algorithm		
SECTION - II				
5	**Compilers**			
	5.1	Statement of a problem, Recognizing basic elements, Recognizing Syntactic units and Interpreting meaning	**15**	**18**
	5.2	Intermediate form :- Arithmetic statements , non arithmetic statement, non-executable statements		
	5.3	Storage Allocation, Code Generation: Optimization (M/c independent), Optimization (M/c dependent)		
	5.4	Assembly Phase, General Model of Compiler, Phases of a Compiler: Lexical Phase		
	5.5	Tasks, databases, algorithm, Syntax Phase: Databases, Algorithm,		
	5.6	Interpretation Phase: Databases, Algorithm. Optimization : Databases, Algorithm.		
	5.7	Storage Assignment: Databases, Algorithm. Code Generation : Databases, Algorithm.		
	5.8	Assembly Phase : Databases, Algorithm. Passes of a Compiler		
	5.9	Data Structures: Statement of the problem. Implementation, Recursion , call and return statements		

	5.10	Storage Classes –Use, Static Storage , Automatic Storage ,Internal Controlled storage, External Controlled storage, Base storage, Implementation Static Storage, Automatic Storage ,Controlled & Based storage, Block Structure, Accessing information for block structure, Storage allocation for block structure		
	5.11	Non-local go to's, Interrupts, Pointers.		
6	**Parsing**			
	6.1	Parse tree & abstract syntax tree	**03**	**10**
	6.2	Parsing Techniques: Top down parsing Implementing Top down parsing,		
	6.3	Comment on Top down parsing, Top down parsing		
	6.4	Without backtracking, Practical Top down parsing Bottom up parsing, LALR parsing		
7	**Software Tools**			
	7.1	Software tools for program	**08**	**12**
	7.2	Development , Editors, Debug monitors		
	7.3	Programming environments, User interfaces		
		Total	**64**	**80**

List of Practicals Experiments/Assignments:

Sr. No.	Name of Experiment/Assignment	Hrs
1	Programs on sorting and searching techniques mentioned.	02
2	Programs on sorting and searching techniques mentioned.	02
3	Design of a single pass assembler	02
4	Design of a two pass assembler.	02
5	esign of macro processor	06
6	Design of loaders	04
7	Design of various phases of Compiler.	02
8	Demonstrating use of parsing techniques on given string	02
9	Design of linkage editor	10
	Total	**32**

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1	Introduction	Explanation of different system component
2	Assemblers	Explanation of different searching & sorting techniques, and design of PASS 1 , PASS 2 assembler.
3	Macro language & macro processors	Explanation of facilities used in macro.
4	Loaders	Explanation of loader and it's schemes.
5	Compilers	Explanation of different phases of compiler.
6	Parsing	Explanation of various parsing techniques.
7	Software tools	Explanation of software tools.

Text Books:

Sr. No	Author	Title	Publication
1	John J. Donovan	Systems Programming	Tata_McGraw Hills
2	Dhamdhere	Systems Programming and Operating systems	Tata McGraw Hills

Reference Books:

Sr. No	Author	Title	Publication
1	Dhamdhere	Systems Programming and Operating systems	Tata McGraw Hills

Learning Resources: OHP, chalk & Board, LCD Projector

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
SECTION - I					
1	Introduction	04	01	01	06
2	Assemblers	08	02	02	12
3	Macro language & macro processors	06	02	02	10
SECTION - II					
4	Loaders	06	02	04	12
5	Compilers	10	02	06	18
6	Parsing	06	02	02	10
7	Software tools	06	02	04	12
	Total	**46**	**13**	**21**	**80**

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Programme : Diploma in Computer Engineering/Information Technology
Programme Code : 06/07
Name of Course : Computer Security
Course Code : CM764

Teaching Scheme:

	Hours /Week	Total Hours
Theory	04	64
Practical	02	32

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	**Two class tests of 60Min. duration**	**3 hrs.**	**---**	**---**	**---**
Marks	**20**	**80**	**---**	**25**	**25**

Course Rational:

Computer security is one of the most important and relevant area of computing today. The requirement to address security in computer system design is an important design consideration in many of today's system. It is essential to understand various threats to secure computing and the basic security design principles and techniques developed to address these threat to confidentiality, integrity and availability. This course will introduce basic cryptography, fundamentals of computer/network security, risks faced by computers and networks ,security mechanisms, operating system security ,secure systems design principles, and information and information systems within organizations .It focuses on concepts and methods associated with planning managing and auditing security at all levels including networks.

Course Objectives:

After studying this course, the student will be able to

- Understand the risks faced by Computer Systems and the nature of common Information hazard.
- Identify the potential threats to confidentiality, integrity and availability of Computer system
- Understand the working of standard security mechanisms.
- Use cryptography algorithms and protocols to achieve Computer Security.
- Understand the threats and security mechanisms for Computer Networks.
- Build systems that are more secure Operating Systems and applications.

Course Content:

Chapter No.	Name of Topic/Sub topic		Hrs	Weigh tage
1	**Introduction and Security trends**			
	1.1	Threats to security: Viruses and worms, Intruders, Insiders, Criminal organizations, Terrorists, Information Warfare, A venues of attack, steps in attack	**10**	**12**
	1.2	Type of attack: Denial of service, backdoors and trapdoors,sniffing,spoofing,man in the middle,replay,TCP/IP Hijacking, encryption attacks Malware:Viruses,Logic boms		
	1.3	Security Basics - Confidentiality, Integrity, Availability, Operational model of Computer Security, Layers of security		
	1.4	Access control: Discretionary, Mandatory, Role based Authentication: Certificates Tokens, Multifactor		
2	**Organizational/Operational security**			
	2.1	Role of people in security: Password selection, Piggybacking, Shoulder surfing, Dumpster diving, Installing unauthorized software/hardware, Access by non employees Security awareness, Individual user responsibilities.	**10**	**15**

	2.2	Security policies,standards,procedures and guideline		
	2.3	Physical Security : Access controls biometrics: finger prints, hand prints,Retina,patterns,voice patterns, signature and writing patterns, voice patterns,keystrokes,Physical barriers.		
	2.4	Social Engineering.		
3	**Cryptography and Public Key Infrastructure**			
	3.1	Encryption algorithm /Cipher, Caesar's Cipher, Shift cipher, substitution software Vigenere cipher.	**10**	**12**
	3.2	Transposition Techniques, Seganography		
	3.3	Hashing,SHA		
	3.4	Symmetric encryption, DES(Data encryption standard), Asymmetric encryption, Digital Signatures, Keyescrow		
	3.5	Public key infrastructures: basics, digital certificates, certificate authorities, registration authorities, step for obtaining a digital certificate, steps for verifying authenticity and integrity of a certificate		
	3.6	Centralized or decentralized infrastructure, private key protection.		
	3.7	Trust models: Hierrchical, peer to peer, hybrid.		
SECTION – II				
4	**Network Security**			
	4.1	Firewalls: working design principles trusted systems Kerberos.	**12**	**16**
	4.2	Security topologies - security zones, DMS, Internet, VLAN, security implication tunneling.		
	4.3	IPsecurity: overview, architecture, IPSec, IPSec configuration, IPSec security		
	4.4	Virtual Private Network		
	4.5	Email Security :security of email transmission, malicious code, spam, mail encryption		

5	**System security**			
	5.1	Intruders, Intrusion detection systems (IDS).host based IDS, network based IDS	**10**	**12**
	5.2	Password Management, vulnerability of password, password selection strategies, components of a good password		
	5.3	Operating system security: Operating system updates : hot fix, patch, service pack		
6	**Application and web security**			
	6.1	Application hardening, application patches, web servers, active directory	**12**	**12**
	6.2	Web security threats, web traffic security approaches ,secure socket layer and transport layer security secure electronic transaction.		
	6.3	Software development: Secure code techniques, buffer overflows, code injection, least privilege, good practices,reqirments,testing		
		Total	**64**	**80**

List of Practicals/Experiments/Assignments:

Note: For the tools mentioned in above practical list free downloadable Software's may be used.

Sr. No.	Name of Experiment/Assignment	Hrs
1	Study of any Antivirus Installation & Configurations Study/Demo of Packet Sniffers Study of Standard Vulnerabilities.	08
2	Study of IT Act . Study of Cyber Laws.	08
3	Write programs for encryption and decryption Practice use of Digital Signatures	04
4	Setting firewall with Windows XP, its importance and Problems. Study setting of Security levels in email	04

5	Study of any intrusion detection S/W . Demonstrate any password cracking tools Demonstrate any data recovery tools	04
6	Creation of memory resident program Program using Interrupt to keep CAPS LOCK off.	04
	Total	**64**

Instructional Strategy:

S.N.	Topic	Instructional Strategy
1.	Introduction and Security trends:	Introduction and Explanation, Demonstration
2	Organizational/Operational security:	Introduction and Explanation, Demonstration
3.	Cryptography and Public Key In frastructure:	Introduction and Explanation, Demonstration
4.	Network Security:	Introduction and Explanation, Demonstration
5.	System security:	Introduction and Explanation, Demonstration
6.	Application and web security:	Introduction and Explanation, Demonstration

Text/Reference Books:

SR. NO.	AUTHOR	TITLE	PUBLISHER
1	Wm.Arthur Cokin Dwayne Williams Gregory B. White RogerL.Davis Chuck Cothren	Principles of computer security Security+and Beyond	Mc Graw Hill Technology Eduction Intenational Edition2005
2	Wm.Arthur Cokin Dwayne Williams Gregory B. White RogerL.Davis Chuck Cothren	Principles of computer security Security+and Beyond	Mc Graw Hill Technology Eduction Intenational Edition2005

Learning Resources: LCD Projector ,Black Board and Online Demo.

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	Introduction and Security trends:	04	04	04	12
2.	Organizational/Operational security:	04	04	04	12
3.	Cryptography and Public Key Infrastructure:	04	04	06	14
4.	Network Security:	04	04	04	12
5.	System security:	04	04	04	12
6.	Application and web security:	06	04	06	16
	Total	**26**	**24**	**28**	**80**

(Prof. Smt. M.H.Thakare)
Prepared By

(Prof. S. B. Kulkarni)
Secretary, PBOS

(Prof. S.B.Nikam)
Chairman, PBOS

Programme : Diploma in Computer Engineering/Information Technology
Programme Code : 06/07
Name of Course : Software Testing
Course Code : CM765

Teaching Scheme:

	Hours /Week	Total Hours
Theory	02	32
Practical	04	64

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests , each of 60 minutes	3Hrs.	--	--	--
Marks	**10**	**40**	**50**	**--**	**50**

Course Rationale:

Software testing will introduce you to basic of software testing, teaching you not just the fundamentals of teaching skills but also supporting skills necessary to become a successful software tester .You will learn how to immediately find problems in any computer program, how to plan an effective test approach, how to clearly report your finding, and to tell when your software is ready for release.

Course Objectives:

After studying this course, the student will be able to

- Understand the impact of software bugs and importance of software testing.
- Develop the skills necessary to find bugs an any types of software testing
- Learn how to effectively plan test, communicate the bugs you find and measure your success as a software tester.

- Use your new testing skills to test not just the software ,but also the product specification the raw code, and even the user's manual
- Learn how to test software for compatibility, usability and cultural issues.
- Discover how to improve testing efficiency by automating your test.

Course Content:

Chapter No.	Name of Topic/Sub topic		Hrs	Weightage
	SECTION- I			
1	**Basics of Software Testing**			
	1.1	Error and bug terminology, Testing terms, Test effort, The Fundamental Test Process	**04**	**05**
	1.2	Test planning and control , Test analysis and design, Test implementation and execution ,Evaluation of the test exit criteria and reporting,		
	1.3	Test closure activities, General principles of testing		
	1.4	Requirement gathering and analysis, Planning, Design, Coding, Testing, Maintenance		
	1.5	Quality Assurance and Quality Control, Testing, Verification and Validation.		
2	**Types of Testing**			
	2.1	White box testing : Static testing , Structural testing	**08**	**09**
	2.2	Black box testing : Requirement based testing, Positive and Negative testing , Boundary value analysis, Decision tables, Equivalence partitioning, User documentation testing		
	2.3	Integration testing: Top-Down and Bottom-Up integration, System integration, Scenario testing,		
	2.4	System and Acceptance testing: Functional system testing, Design /Architecture testing, Deployment testing, Beta testing,		
	2.5	Non-functional system testing: Configuration testing, Scalability and Reliability testing, Acceptance testing, Internationalization testing, Localization testing		

3	**Special Tests**			
	3.1	GUI testing: Compatibility testing, Security testing	**04**	**06**
	3.2	Performance and Stress testing, Recovery and Installation testing		
	3.3	Smoke and Sanity testing: Regression testing, Usability testing		
	3.4	Object oriented application testing: Client-Server testing, Web based testing		
SECTION - II				
4	**Test Management**			
	4.1	Test Planning : Preparing a test plan, Scope management, Deciding test approach, Setting up criteria for testing, Identifying Responsibilities, Staffing, Training needs, Resource requirements, Test deliverables, Testing tasks	**06**	**08**
	4.2	Test Management: Choice of standards, Test infrastructure management, Test people management , Integrating with product release		
	4.3	Test Process: Baselining a test plan, Test case specification, Update of Traceability matrix, Executing test cases, Collecting and analyzing metrics, Preparing test summary report		
	4.4	Test Reporting: Recommending product release.		
5	**Defect Management**			
	5.1	Introduction, Defect classification, Defect management process	**04**	**05**
	5.2	Defect life cycle, Defect template		
	5.3	Estimate expected impact of a defect, Techniques for finding a defects, Reporting a defect		

6	**Testing Tools and Measurements**			
	6.1	Features of test tool: Guideline for selecting a tool	**06**	**07**
	6.2	Static and dynamic testing tool, Advantages and Disadvantages of using tools		
	6.3	When to use Automated test tools, Testing using Automated tools		
	6.4	What are metrics and measurement.: Types of Metrics, Project metrics, Progress and Productivity Metrics		
		Total	**64**	**80**

List of Practicals/Experiments/Assignments:

Sr. No.	Name of Experiment/Assignment	Hrs
1	Introduction to software Testing Concepts.	08
2	Case Study:-Study any system specification and report bugs. Display ”Hello world” Write a program to demonstrate use of 1) For… Loop 2) Switch……case 3) Do…While 4) If….else Automate Notepad Application.	16
3	Automate any installation procedure (e.g. WinZip) Automate Microsoft Word Application a. Open Microsoft Word b. Type text (automatically) c. Generate random file name. Save file and close Microsoft Word. Assignment for web Testing (use any web testing tools e.g. Selenium)	08
4	Create any GUI Application e.g. Calculator. Write Test Cases For any Application (e.g. Railways reservation Form)	12
5	Case study on Defect Management.	08
6	Case study on Testing Tools and Measurements.	12
	Total	**64**

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1	Basics of Software Testing	Explanation & case study
2	Types of Testing	Explanation, Case study & Implementation
3	**Special Tests**	Explanation, Case study & Implementation
4	Test Management and planning	Explanation, Case study & Implementation
5	Defect Management	Explanation, Case study & Implementation
6	Testing Tools and Measurements	Explanation, Case study & Implementation

Text Books:

Sr. No	Author	Title	Publication
1	Srinivasan Desikan Gopalaswamy Ramesh	Software Testing: Principles and Practices	PEARSON
2	M G Limaye	Software Testing: Principles, Techniques and Tools	McGraw-Hill

Reference Books:

Sr. No	Author	Title	Publication
1	Andreas Spillner, Tilo Linz, Hans Schaefer	Software Testing Foundations	Rocky nook
2	John A. Estrella Maria C. Estrella	Sample Exam Questions ISTQB	SPD

Learning Resources:

Black Board, Transparencies, Overhead projector, LCD, White Board.

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Basics of Software Testing	01	02	02	05
2	Types of Testing	03	02	04	09
3	Special Tests	02	01	03	06
4	Test Management and planning	02	02	04	08
5	Defect Management	02	01	02	05
6	Testing Tools and Measurements	02	01	04	07
	Total	**12**	**09**	**19**	**40**

(Prof. T.A.Kumbhare & Prof. N.A.Inamdar)
Prepared By

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Secretary, PBOS

(Prof. S.B.Nikam)
Chairman, PBOS

Programme : Diploma in CM/IT
Programme Code : 06 / 07
Name of Course : Windows Programming
Course Code : CM766

Teaching Scheme:

	Hours /Week	Total Hours
Theory	**04**	**64**
Practical	**02**	**32**

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests , each of 60 minutes	3Hrs.	--	--	--
Marks	**20**	**80**	**25**	--	**25**

Course Rationale:

Today's workplace is constantly changing and adopting new technologies. In this era of Visual Programming it has become necessary to be able to develop GUI programs. As the industries rely on Visual C++ for its power and efficiency, VC++ has been used as the Windows Programming Tool. In this course the students will get the most out of Windows Programming.

Course Objectives:

After studying this course, the student will be able to

- To handle Keyboard Input
- To handle Mouse Input
- To create Check Boxes, Radio Buttons, List Boxes, Combo Boxes, Scroll Bars etc.
- To create Menus, Toolbar buttons etc.
- To create Dialog Boxes, add controls etc.

Course Content:

Chapter No.	Name of Topic/Sub topic		Hrs	Weightage
SECTION - I				
1	**Overview of MS-Windows**			
	1.1	The Windows Environment, Windows Programming Options, Your First Windows Program,	**08**	**10**
	1.2	A brief History of Character Sets, Wide Characters And C, Wide Characters And Windows,		
	1.3	Windows and Messages		
2	**An Exercise in Text Output:**			
	2.1	Introduction to GDI	**12**	**18**
	2.2	Scroll bars, Building a better Scroll		
	2.3	The Structure of GDI, The Device Context		
	2.4	Drawing Dots and Lines, Drawing Filled Areas		
	2.5	The GDI Mapping Mode		
	2.6	Rectangles, Regions and Clipping.		
3	**The Keyboard and Mouse**			
	3.1	Keyboard Basics	**12**	**12**
	3.2	Key-stroke Messages, Character Messages, Keyboard Messages and Character Sets		
	3.3	Mouse Basics		
	3.4	Client- Area Mouse Messages, Non-Client- Area Mouse Messages, Hit-Testing in your Programs, Capturing the Mouse		
SECTION - II				
4	**The Timer**			
	4.1	Timer Basics	**12**	**16**
	4.2	Using the Timer: Three Methods, Using the Timer for a Clock, Using the Timer for a Status Report		
	4.3	Child Window Controls:		
	4.4	The Button Class, Controls and Colors, The Static Class, The Scroll Bar Class, The Edit Class, The List Box Class		

5	**Menus and Other Resources**			
	5.1	Icons, Cursors, strings and Custom Resources	**10**	**12**
	5.2	Menus, Keyboard Accelerators		
6	**Dialog Boxes:**			
	6.1	Modal Dialog Boxes, Modeless Dialog Boxes,	**10**	**12**
	6.2	The Common Dialog Boxes		
		Total	**64**	**80**

List of Practicals/ Experiments/Assignments:

Sr. No.	Name of Experiment/Assignment	Hrs
1	Getting Familiar with VC++, parts of a VC++ Program	02
2	Writing Simple Programs using VC++.	02
3	Programs on drawing dots, lines	02
4	Programs on drawing filled areas, rectangles.	02
5	Programs on Reading Keystrokes from the Keyboard, Displaying Our Text, Finding the size of the window	04
6	Programs for handling the Mouse.	04
7	Creating Check Boxes, Radio buttons, List Boxes, Combo Box, Scroll Bar	06
8	Programs for creating Menus, Toolbar buttons etc	06
9	Programs for creating Dialog boxes, adding controls, connecting methods to dialog box controls	04
	Total	**32**

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1	Overview of MS-Windows	Lecture method, Demonstration
2	An Exercise in Text Output	Lecture method, Demonstration
3	The Keyboard and Mouse	Lecture method, Implementation
4	The Timer	Lecture method, Implementation
5	Child Window Controls	Lecture, Demonstration & Discussion
6	Menus and Other Resources	Lecture method, Demonstration
7	The Clipboard	Lecture method, Demonstration
8	Dialog Boxes	Lecture method, Demonstration

Text Books:

Sr. No	Author	Title	Publication
1	Charles Petzold	Programming Windows	Microsoft Press

Reference Books:

Sr. No	Author	Title	Publication
1	Steven Holzner	**Microsoft Visual C++ 5**	BPB
2	Brent E. Rector Joseph M. Newcomer	Win32 Programming	Addison Wesley

Learning Resources: Books, Models

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
SECTION - I					
1.	Overview of MS-Windows	04	04	02	10
2.	An Exercise in Text Output	04	04	10	18
3.	The Keyboard and Mouse	02	02	08	12
SECTION - II					
4.	The Timer Child Window Controls	04	04	08	16
5.	Menus and Other Resources	02	04	06	12
6.	Dialog Boxes	02	04	06	12
	Total	**18**	**22**	**40**	**80**

(Prof. A.K.Sawant)
Prepared By

(Prof. S. B. Kulkarni)
Secretary, PBOS

(Prof. S.B.Nikam)
Chairman, PBOS

Programme : Diploma in Computer Engineering.
Programme Code : 06
Name of Course : Advanced Web Programming Using JSP
Course Code : CM767
Pre-Requisite : CM563 (Java Programming)

Teaching Scheme:

	Hours /Week	Total Hours
Theory	**04**	**64**
Practical	**02**	**32**

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Three class tests, each of 60 minutes	3Hrs.	--	--	--
Marks	**20**	**80**	**--**	**25**	**50**

Course Aim:

JSP is widely used server side scripting language. This course aims at providing in depth knowledge of sever side scripting through JSP.

Course Objectives:

After studying this course, the student will be able to

- Understand Server side programming Using JSP.
- Make use of JSP tag and develop JSP scriplet.
- Write programs using threads and thread management.
- Write programs for managing sessions.
- Write programs for Event handling and using filters.
- Understand Request Dispatching and establishing database connectivity.

Course Content:

Sr. No.	Name of Topic/Sub topic		Hrs	Weightage
	SECTION I			
1	**Introduction to Web Programming Environment:**			
	1.1	Evolution of the Web Application	10	12
	1.2	Overview of the Hypertext Transfer Protocol (HTTP): The HTTP Specification, HTTP Request Model.		
	1.3	Introduction to Servlets: Servlet Life Cycle, servlet Classes, Threading Models, HTTP sessions		
	1.4	JSP Overview.		
2	**Elements of JSP:**			
	2.1	JSP Syntax and Semantics: The JSP Development Model ,Components of JSP page,Complete example.	12	12
	2.2	Expressions, Scriplets and Declarations: Expressions, Scriplets, Declarations.		
3	**Request Dispatching and Session and Thread Management:**			
	3.1	Request Dispatching: Anatomy of Request processing, Including Other Resources.	12	16
	3.2	Session and Thread Management: Session Tracking , The Session API, Thread Management, Servlet Threading Models, Multithreaded Applications,Application considerations		
	SECTION II			
4	**Application Event Listeners and Filters:**			
	4.1	Application Event Listeners: Beyond Session Binding Listeners, Event Scope, Event Listener Interfaces,Examples.	10	12
	4.2	Filters: Filter overview, Developing and deploying a Filter,A request filter example, A response filter example.		

5	**JSP Tag Extensions:**			
	5.1	Introduction to Custom Tags: Why Custom Tags, Developing your first Custom Tag, How Tag handlers Works, tag Libraries, The Tag Handler API, The Tag Handler Life Cycle, Define Tag Attributes, the iteration of Tag interface, The Body tag Handler API.	12	16
	5.2	Expression Language: What is EL? EL syntax,		
	5.3	Functions		
	5.4	The JSP Standard Tag Library (JSTL): Getting started with JSTL, Core Tags, XML Tags, SQL Tags, Formatting Tags.		
	5.5	Simple Tag Extensions, tag Files, and JSP Fragments: JSP Fragments, The Simple Tag Interface, Tag Files.		
6	**JSP Applications:**			
	6.1	Database Access With JDBC: Overview of JDBC,JDBC Drivers, Connecting to a Database With Driver manager,	**08**	**12**
	6.2	Connecting to a Database Using JNDI data Source, the Statement Interfaces, Result Sets.		
	6.3	JSP Testing and Debugging: Building a Mental Model, Testing in Isolation, Debugging Tools		
		Total	**64**	**80**

List of Experiments/Assignments:

Note : For Practicals actual program statements should be framed by respective faculty .

Sr. No.	Name of Experiment/Assignment	Hrs
1.	• Installation of Web Serever. • Write a program for demonstration of Generic servlets. • Write a program for demonstration of HTTP Servlets. • Write a simple JSP program and monitor the corresponding servlet class.	06

2.	• Write a simple JSP program program for Demonstrating use of all basic elements . • Write a simple JSP program program for Demonstrating use of expressions, declarations .	04
3.	• Write a JSP program program for Demonstrating use of request dispatching. • Write a simple JSP program program for Demonstration of Session Management . • Write a simple JSP program program for Demonstration of Thread Management .	06
4.	• Write a JSP program program for Demonstration of Event Listeners. • Write a JSP program program for Demonstration of Filters.	04
5.	• Write a JSP programs for Demonstration of all tags covered in chapter.	06
6.	• Write a JSP program for Demonstration of connecting to database using JDBC and JNDI data Source.	06
	Total	**32**

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1.	Introduction to Web Programming Environment	Introduction and Explanation, Slide Presentation
2.	Elements of JSP	Explanation, Slide Presentation
3.	Request Dispatching and Session and Thread Management	Explanation, Slide Presentation
4.	Application Event Listeners and Filters	Explanation, Slide Presentation,
5.	JSP Tag Extensions	Explanation ,Slide Presentation,
6.	JSP Applications	Explanation, Presentation

Text Books:

Sr. No	Author	Title	Publication
1	Phill Hanna	The Complete Refernce:JSP 2.0	Tata-McGraw Hill

Reference Books:

Sr. No	Author	Title	Publication
1.	Hans Bergsten	Java Server Pages	O'Reilly
2.	Mathew Siple	Java Database Programming	Tata Mc-Graw Hill

Learning Resources: Books, LCD, White board.

Specification Table:

Sr. No.	Topic	Knowledge	Comprehension	Application	Total
1.	Introduction to Web Programming Environment	05	05	02	12
2.	Elements of JSP	02	04	06	12
3.	Request Dispatching and Session and Thread Management	06	04	06	16
4.	Application Event Listeners and Filters	04	02	06	12
5.	JSP Tag Extensions	06	04	06	16
6.	JSP Applications	02	04	06	12
	Total	**25**	**23**	**32**	**80**

(Prof. Smt. M.H.Thakare) **(Prof. S. B. Kulkarni)** **(Prof. S.B.Nikam)**

Prepared By **Secretary, PBOS** **Chairman, PBOS**

Programme : Diploma in Computer Engineering.
Programme Code : 06
Name of Course : UNIX O.S. Programming
Course Code : CM768
Pre-Requisite : CM562

Teaching Scheme:

	Hours /Week	Total Hours
Theory	**04**	**64**
Practical	**02**	**32**

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests of 60 Min. duration	**3 Hrs.**	--	--	--
Marks	**20**	**80**	--	**25**	**25**

Course Rational:

Operating Systems are most essential components of Computer System. UNIX is the earliest, multi-user operating system and highly robust, reliable and efficient. The course aims in providing in depth knowledge of design of UNIX operating system .

Course Objectives:

After studying this course, the student will be able to

- General overview of the UNIX system
- Kernel, The Buffer cache and Internal Representation of files
- System calls for the file system.
- understand the structure of processes and their representation in memory.

Course Content:

Chapter No.	Name of Topic/Sub topic		Hrs	Weightage
	SECTION-I			
1	**General Overview of the system**			
	1.1	History, System structure	**08**	**10**
	1.2	User perspective-The File system, Processing Environment, Building Block Primitives, Operating System services		
	1.3	Assumptions about Hardware-Interrupts and Exception, Processor Execution Levels, Memory Management		
2	**Introduction to the kernel**			
	2.1	Architecture of the Unix operating System	**08**	**10**
	2.2	Introduction to system concepts- An overview of the file subsystem, Processes, Context of a process, Process states, State transitions, Sleep and wakeup		
	2.3	Kernel data structures		
	2.4	System administration		
3	**The buffer cache**			
	3.1	Buffer headers, Structure of the buffer pool, Scenarios for retrieval of a buffer.	**08**	**10**
	3.2	Reading and writing disk blocks		
	3.3	Advantages and disadvantages of the buffer cache		
4	**Internal representation of files**			
	4.1	Inodes- Definition, Accessing Inodes, Releading Inodes, Inode assignment to a new file	**08**	**10**
	4.2	Structure of a regular file, Directories, Conversion of a path name to an Inode, Super block		
	4.3	Allocation of disk blocks,Other file types		

SECTION-II				
5	**System calls for the file system**			
	5.1	Open, Read, Write, File and record locking, Adjusting the position of file I/O – lseek, Close, File creation,Creation of special files, Change directory and change root, Change owner and change mode, Stat and fstat	**16**	**20**
	5.2	Pipes-The pipe system call , opening a named pipe, reading and writing pipes, closing pipes, Examples		
	5.3	Dup, Mounting and unmounting file systems, crossing mount points in file path names, unmounting a file system		
	5.4	Link, Unlink-File System Consistency , Race conditions, File system abstractions		
	5.5	File system maintenance		
6	**The structure of processes:**			
	6.1	Process states and transitions	**16**	**20**
	6.2	Layout of system memory- Regions, Pages and Page tables, layout of the kernel, the U area, The context of a process.Saving the context of a process- Interrupts and Exceptions, System call interface, Context switch, Saving context for abortive returns, Copying data between system and user address space		
	6.3	Manipulation of the process address space- Locking and Unlocking a region, Allocating a region, Attaching a region to a Process, Changing the size of a region, Loading a region, Freeing a region, Detaching a region from a process, Duplicating a region, Seep- Sleep events and addresses, Algorithms for sleep and Wakeup		
		Total	**64**	**80**

List of Practicals/ Experiments/Assignments:

Sr. No.	Name of Experiment/Assignment	Hrs
1	• Write a C program for copying standard Input to Standard Output. • Practice Changing the defs.h header file . • Write a C program that interprets command line arguments passed to it by O.S. according to the standard command format and prompts if any argument is missing.	06
2	• Practice commands for setting special permissions like sgid,suid and sticky bit.	02
3	• Write a who program that prints the time when each person logged in to the System.	04
4	• Write a program or opening a file passed as argument. • Write a program that tests presence of a file. • Write a program that numbers the lines in its standard input file before copying them to the standard output file.	04
5	• Write C programs for simulation of getchar, putchar, errchar . Make use of System calls. • Write a C program to copy one file to another. Make use of System call. • Practice linking and unlinking files.	10
6	• Write a C program that prints all error messages from system calls. • Write a C program to execute a prgram date by using the exec system call. • Write a program to demonstrate the fork system call.	6
	Total	**32**

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1	General Overview of the System	Introduction and Explanation, Slide Presentation , Simulation of Algorithms
2	Introduction to the Kernel	Explanation, Slide Presentation, Simulation of Algorithms
3	The Buffer Cache	Explanation, Slide Presentation, Simulation of Algorithms

4	Internal Representation of Files	Explanation, Slide Presentation, Simulation of Algorithms
5	System Calls for the File System	Explanation ,Slide Presentation, Simulation of Algorithms
6	The structure of Processes	Explanation, Presentation

Text Books:

Sr. No	Author	Title	Publisher
1	Maurice J. Bach	The Design of the Unix Operating System	PHI
2	Sumitabha Das	Unix Concepts & Applications- Includes SCO UNIX & LINUX	TMH

Reference Books:

Sr. No	Author	Title	Publisher
1	Richard Peterson	Linux: The Complete Reference	TMH

Learning Resources: Books, LCD, White board.

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	General Overview of the System	05	03	02	10
2.	Introduction to the Kernel	05	03	02	10
3.	The Buffer Cache	05	03	02	10
4.	Internal Representation of Files	05	03	02	10
5.	System Calls for the File System	10	06	04	20
6.	The structure of Processes	10	06	04	20
	Total	**40**	**24**	**16**	**80**

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