

**SARDAR PATEL UNIVERSITY**  
**Programme & Subject: B.Sc. (CA & IT) – M.Sc. (CA & IT) Dual Degree**  
**Semester: IV**  
**Syllabus with Effect from: June-2017**

<b>Paper Code: PS04CIIT01</b>		<b>Total Credit: 3</b>
<b>Title Of Paper: Operating Systems - II</b>		
<b>Unit</b>	<b>Description in detail</b>	<b>Weightage (%)</b>
I	<b>Memory Management Techniques:</b> Basic Memory Management Address Binding Logical versus Physical Address Space Dynamic Loading Dynamic Linking Swapping Contiguous Memory Allocation Paging Segmentation	25%
II	<b>Virtual Memory Management</b> Concept of virtual memory management. Demand Paging. Page replacement. Basic page replacement. Page replacement algorithm: FIFO page replacement Optimal page replacement LRU page replacement Additional Reference Bit Second-Chance Enhanced Second Chance.	25%
III	<b>File Management</b> File system structure File system implementation: Partitioning and mounting, Virtual file system. Directory implementation: Linear list and Hash table. Allocation Methods: Contiguous, Linked, Indexed. Recovery: Consistency checking, Log structured file systems, Backup and Restore.	25%
IV	<b>I/O Management</b> Introduction to I/O system I/O Hardware: Polling, Interrupts, DMA Application I/O interface. Kernel I/O subsystem.	25%

**Basic Text & Reference Books:-**

Operating system concepts, 8th edition by Abraham Silberschatz , Peter B. Galvin, Greg Gagne  
.Publisher - Wiley



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<b>Paper Code: PS04CIIT02</b>	<b>Total Credit: 3</b>
<b>Title Of Paper: Data Communication &amp; Networking</b>	

Unit	Description in detail	Weightage (%)
I	<p><b>Introduction to Computer Networks</b>            Computer Networks : Definition and Advantages            Classification of Computer Networks            Introduction and differences among Local Area Networks (LANs), Metropolitan Area Networks (MANs), Wide Area Networks (WANs)            Communication Mode, Data encoding: analog and digital            Definitions: data rate, baud rate, modulation rate, frequency, spectrum, bandwidth, server, host.            Various types of transmission media - guided transmission media: magnetic media, twisted pair, coaxial cables, fiber optics, Introduction to unguided transmission media            LAN Topologies            Functions of various networking components : modems, amplifiers, repeaters, hubs, switches, bridges, routers, gateway</p>	25%
II	<p><b>Data Communication Fundamentals and Layered Protocols</b>            Introduction to the concept of modulation, types of modulation, serial transmission vs. parallel transmission, synchronous transmission v/s asynchronous transmission, circuit switching, packet switching            The concept of multiplexing, Frequency Division Multiplexing (FDM) and. Time Division Multiplexing (TDM)            Protocol significance and hierarchies            Design issues for the layers, Error Detection and correction            The OSI Reference model, functions and responsibilities of each layer. TCP/IP Reference model. Comparison of OSI and TCP/IP            Examples of protocols for different layers of the OSI model.</p>	25%
III	<p><b>Network Layer , Transport Layer and Network Security</b>            CSMA/CD            TCP            IP            Fast Ethernet</p>	25%
IV	<p><b>Wireless Networks</b>            Introduction to wireless networks            Radio, VHF, microwave, infrared, light-wave transmission            Communication satellites            Wireless Network Topologies, Cellular Topology, Cell Fundamentals Concepts of GSM, GPRS, CDMA and SMS.            Wireless LANs, Wireless Geolocation systems</p>	25%

## **Basic Text & Reference Books:-**

- Behrouz Forouzan, Introduction to Data Communications and Networking, Tata McGraw-Hill Publishing Co. Ltd., New Delhi, 1998.
- Tanenbaum A. S., Computer Networks, Prentice-Hall of India Pvt. Ltd., New Delhi, 1997.
- Stallings W., Data and Computer Communications, 3<sup>rd</sup> Edition, Macmillan Pub. Company, New York, 1991.
- Kaveh Pahlavan and Prashant Krishnamurthy: Principles of Wireless Networks, Pearson Education Asia, 2002.

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**Semester: IV**

**Syllabus with Effect from: June-2017**

<b>Paper Code: PS04CIIT03</b>		<b>Total Credit: 3</b>
<b>Title Of Paper: Visual Programming Through VB.NET</b>		
Unit	Description in detail	Weightage (%)
I	<p><b>Introduction to .NET Framework and VB.NET</b>                      .NET Architecture, .NET Languages, Microsoft Intermediate Language (MSIL), The Just-In-Time (JIT) compiler, Working with Assemblies, The .NET framework class library                      VB.NET - introduction, applications and types of project                      Introduction to Visual Studio IDE                      Creating simple Windows Application using VB.NET                      Variables, data types, constants and operators                      Type casting, Boxing and Unboxing,                      Working with arrays and strings                      Creating simple Windows Application using VB.NET</p>	25%
II	<p><b>VB.NET Basics</b>                      Use of conditional statement (if), multi branching statement (select) and With...End With statement,                      Looping Statement: DO, FOR, FOR EACH..NEXT and WHILE, Working with EXIT, CONTINUE and WITH statements                      Working with procedures – introduction, types, use of parameters, parameter passing, calling procedures                      OOP concepts - Encapsulation, Inheritance, Interfaces and Polymorphism                      Working with modules, classes (partial) and namespaces                      Working with Windows Forms – introduction, life cycle, basic properties, methods and events, use of simple windows forms control. Working with SDI and MDI forms</p>	25%
III	<p><b>Developing Windows Forms, Exception Handling</b>                      Working with basic controls – Button, Check Box, Checked List Box, Combo Box, Date Time Picker, Group Box, HScroll Bar, Radio Button, Vscroll Bar, Label, List Box, Picture Box, Text Box and Time controls.                      Working with advanced controls – Link Label, Rich Text Box, Color Dialog, Font Dialog, Tree View, Working with modules, classes (partial) and namespaces                      Error Handling: exception, structured exception using try...catch and final statement</p>	25%
IV	<p><b>Persisting Data Using Databases and Files</b>                      ADO.NET – introduction and applications                      ADO.NET – architecture (connected and disconnected)                      Database connectivity using ADO.NET                      Use of Data sources, Server Explorer and working with Data Set                      Populating data in a Data Grid View,                      Working with files</p>	25%

**Basic Text & Reference Books:-**

Steven Holzner; VB.NET Black Book by Dreamtech publication  
Francesco Balena : Programming Microsoft Visual Basic.NET, Microsoft Press  
Bill Evjen, Billy Hollis, Bill Sheldon, Kent Sharkey and Tim McCarthy : Professional VB 2005 with .NET 3.0

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<b>Paper Code: PS04CIIT04</b>		<b>Total Credit: 3</b>
<b>Title Of Paper: Relational Database Management Systems - II</b>		
<b>Unit</b>	<b>Description in detail</b>	<b>Weightage (%)</b>
I	<b>Relational Database Design</b> Consequences of poor database design The process of database normalization Functional dependencies Lossless joins and dependency preservation 1st Normal Form, 2nd Normal Form, 3rd Normal Form, Boyce-Codd Normal Form Examples of normalization	25%
II	<b>Basics Of PL/Sql</b> PL/Sql - Introduction And Advantages Understanding PL /Sql Block Structure Fundamentals Of PL /Sql Language - Data Types (Boolean, Char, Number, Date, Varchar2), Variables, Constants And Expressions (Case Expression) Operators Conditional Statement – If and Case Statements Controlling Loop Iterations – Loop, Exit, Exitwhen, While, For Sequential Control Statement – Goto And Null	25%
III	<b>Cursors And Exception Handling</b> Select..Into Statement Working With Cursor : Introduction, Types, Attributes And Processing (I.E. Declaring, Opening, Fetching And Closing), Using Parameterized Cursor, Using Cursor For Loop Error Handling : Introduction, Advantages Of Exceptions, Types Of Exceptions Working With User-Defined Exceptions – Declaration, Raise_Application_Error, Pragma Exception_Init, Sqlcode And Sqlerrm	25%
IV	<b>Stored Subprograms, Database Triggers and Packages</b> Stored procedures – introduction, creating, modifying, executing and dropping procedures Stored functions – introduction, creating, modifying, executing and dropping functions Database triggers – introduction, creating, modifying and dropping triggers, types of triggers Packages – meaning, advantages, creating, modifying and dropping	25%

**Basic Text & Reference Books:-**

An introduction to Database Systems : Bipin C. Desai, Galgotia Publications Pvt. Ltd.  
Ivan Bayross : SQL, PL/SQL The programming language of Oracle, 3rd revised edition, BPB Publications

Kevin Loney, George Koch, Oracle9i The Complete Reference , Oracle Press.  
Buluku Lakshman : Oracle9i PL/SQL : A developer's guide, Apress, edition 2003.

**Books For Additional Reading :**

Understanding Database Management System : S. Parthasarthy and B.W.Khalkar, First edition –  
2007, Master Academy  
P. S. Deshpande : SQL/PLSQL for Oracle9i, dreamtech press, reprint edition 2009





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<b>Paper Code: PS04CIIT05</b>		<b>Total Credit: 6</b>
<b>Title Of Paper: Practicals - IV</b>		
<b>Unit</b>	<b>Description in detail</b>	<b>Weightage (%)</b>
<b>Practical Based On</b>		
	PS03CIIT03 (VB.Net) & PS03CIIT04 (Oracle)	70%
	Project based on C++ & VB.Net	30%

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<b>Paper Code: PS04EIT01</b>		<b>Total Credit: 2</b>
<b>Title Of Paper: Cyber Security</b>		
<b>Unit</b>	<b>Description in detail</b>	<b>Weightage (%)</b>
I	<p><b>Introduction to Cybercrime</b>  Introduction, Cybercrime: Definition and Origins of the Word.  Cybercrime and Information Security.  Who are Cybercriminals?  Classifications of Cybercrimes:  E-Mail Spoofing, Spamming, Cyber defamation, Internet Time Theft, Data Diddling, Forgery, Web Jacking, Hacking, Online Frauds, Software Piracy, Computer Sabotage, E-Mail Bombing/Mail Bombs, and Computer. Network Intrusions, Password Shiffing, Credit Card Frouds, Identify Theft.</p>	25%
II	<p><b>Cyber offenses</b>  Introduction, Categories of Cybercrime  How Criminals Plan the Attacks:  Reconnaissance, Passive Attack, Active Attacks, Attack (Gaining and Maintaining the System Access) Cyberstalking:  Types of Stalkers, Cases Reported on Cyberstalking, How Stalking Works?  Real-Life Incident of Cyberstalking.  Cybercafe and Cybercrimes, Botnets: The Fuel for Cybercrime, Botnet Attack Vector  Cloud Computing: Why Cloud Computing? , Types of Services, Cybercrime and Cloud Computing</p>	25%
III	<p><b>Cybercrime: Mobile and Wireless Devices</b>  Proliferation of Mobile and Wireless Devices.  Trends in Mobility.  Security Challenges Posed by Mobile Devices. Registry Settings for Mobile Devices Attacks on Mobile/Cell Phones:  Mobile Phone Theft, Mobile Viruses, Mishing, Vishing, Smishing, Hacking Bluetooth.  Organizational Measures for Handling Mobile Devices-Related Security Issues: Encrypting Organizational Databases, Including Mobile Devices in Security Strategy.  Organizational Security Policies and Measures in Mobile Computing Era: Importance of Security Policies relating to Mobile Computing Devices, Operating Guidelines for Implementing Mobile Device Security Policies, Organizational Policies for the Use of Mobile Hand-Held Devices.</p>	25%
IV	<p><b>Cybercrime: Tools and Methods</b> Proxy Servers and Anonymizers, Phishing: How Phishing Works?  Password Cracking:  Online Attacks, Offline Attacks, Strong, Weak and Random</p>	25%

	<p>Passwords, Random Passwords.  Key loggers and Spy wares:  Software Keyloggers, Hardware Keyloggers, Antikeylogger, Spywares.  Virus and Worms: Types of Viruses.  Trojan Horses and Backdoors:  Backdoor, How to Protect from Trojan Horses and Backdoors.  DoS and DDoS Attacks:  DoS Attacks, Classification of DoS Attacks, Types or Levels of DoS Attacks, Tools Used to Launch DoS Attack, DDoS Attacks, How to Protect from DoS/DDoS Attacks.  SQL Injection:  Steps for SQL Injection Attack, How to Avoid SQL Injection Attacks.  Buffer Overflow:  Types of Buffer Overflow, How to Minimize Buffer Overflow.</p>	
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**Basic Text & Reference Books:-**

Nina Godbole, Sunit Belapur, “Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives”, Wiley India Publications, April, 2011



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<b>Paper Code: PS04EIT02</b>		<b>Total Credit: 2</b>
<b>Title Of Paper: Basic of UNIX Operating System</b>		
<b>Unit</b>	<b>Description in detail</b>	<b>Weightage (%)</b>
<b>I</b>	<b>Introduction to UNIX</b> A UNIX Biography. Salient features of UNIX : Multiuser Capability, Multitasking Capability, Communication, Security, Portability. Unix System Origination. Types of Shells : Bourne Shell, C Shell, Korn Shell The UNIX file System	25%
<b>II</b>	<b>UNIX Commands</b> Login, logout, passwd, who, who am I, clear, date, cal, bc, man. pwd, cd, mkdir, rmdir, cp, rm, mv, cat, file, ls, chmod, touch, wild cards characters. File redirection (standard input, output), Pipes. wc, cmp, diff, comm, cut, paste, sort, grep.	25%
<b>III</b>	<b>Vi Editor</b> Introduction to vi editor Modes of operation. vi editor commands: Positioning by Characters. Positioning by Line. Positioning by Word. Positioning in the window. Scrolling. Positioning on a Numbered Line. Inserting text. Deleting text. Miscellaneous commands. Quitting vi editor. Block commands. - Search, Find and Replace, Delete and Paste, Yank and Paste.	25%
<b>IV</b>	<b>Shell Scripts</b> Introduction. When to use shell scripts. Shell variables. Shell keywords. Assigning values to variables. Unix-defined or System variables. Positional parameters, passing command line arguments. Arithmetic in shell scripts. Read and echo command. If statement. Test command: File tests, String tests.	25%

	Use of logical operators. Case control structure. While loop, For loop. Break, continue statement.	
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**Basic Text & Reference Books:-**

Yashavant Kanetkar, UNIX Shell Programming, BPB Publications.  
Sumitabha Das : Your UNIX the Ultimate Guide, Tata McGraw Hill.





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<b>Paper Code: PS04FIIT01</b>		<b>Total Credit: 4</b>
<b>Title Of Paper: Computer Based Numerical &amp; Statistical Methods</b>		
<b>Unit</b>	<b>Description in detail</b>	<b>Weightage (%)</b>
I	<b>Computer Arithmetic &amp; Iterative Methods</b> Absolute, Relative and Percentage error The method of successive bisection, an algorithm of bisection method to find a root and examples The method of false position The method of iterative procedure Secant method, illustration and algorithm The method of successive approximations, illustrations and algorithm	25%
II	<b>Interpolation with Equal and Unequal Intervals</b> Interpolation with equal intervals-finite difference table The Gregory- Newton formula for forward and backward interpolation corresponding algorithms and examples Interpolation for unequal intervals using Newton's formula for divided differences Lagrange interpolation Central difference formulae Extrapolation and corresponding examples	25%
III	<b>Differentiation and Solution of Simultaneous Linear Equations</b> Definition and examples of differentiation Higher order derivative of standard functions up to second order The Matrix inversion method The Gauss-Seidel iterative method Comparison of direct and iterative methods	25%
IV	<b>Time Series and Forecasting</b> Utility of Time Series Analysis Components of Time Series - Secular trend, Seasonal variation, Cyclical variation and Irregular variation - Methods on measurement of components – The moving average method - merits and limitations Forecasting models and methods	25%

**Basic Text & Reference Books:-**

Sastry S. S. : Introductory Methods of Numerical Analysis, Prentice Hall of India Pvt. Ltd., 1986(2)  
 Salaria R S : Computer Oriented Numerical Methods, Khanna Book Publishing Co. Ltd., 2000(3)  
 Fundamentals of statistics by S.C. Gupta, Himalaya Publishing House (6)

**Other Reference Books :**

Rajaraman V. : Computer Oriented Numerical Methods, Prentice Hall of India Pvt. Ltd., 1983  
Murray R Spiegel : Theory and Problem of Statistics, McGraw-Hill Schaum's Outline Series,1981.  
A text book of Calculus with an introduction to differential Equation by Dr. Dinesh J. karia,  
Mahendra L. Patel, Roopal Prakashan Vallabh Vidyanagar