



Scheme of Examination

Fifth Semester-Master of Computer Application

S.No	Subject Code	Subject Name	Periods per week			Credits	Maximum Marks (Theory Slot)			Maximum Marks (Practical Slot)		Total Marks
			L	T	P		End Sem. Exam	Tests (Two)	Assignments/Quiz	End Sem. Practical/Viva	Practical Record/Assignment/Quiz/Presentation	
1	MCA 501	Data warehousing & Mining	3	1	-	4	70	20	10		-	100
2	MCA 502	Unix & shell prog.	3	1	-	4	70	20	10	-	-	100
3	MCA 503	Cloud Computing	3	1	-	4	70	20	10	-	-	100
4	MCA 504	.NET Framework Technology	3	1	-	4	70	20	10	-	-	100
5	MCA 505	Elective I	3	1	-	4	70	20	10	-	-	100
6	MCA 506	Minor Project -II	-	-	8	8	-	-	-	120	80	200
7	MCA 507	Lab in Unix & She Prog.	-	-	2	2	-	-	-	30	20	50
		Total	15	5	10	30	350	100	50	150	100	750

L: Lecture - T: Tutorial - P: Practical

Elective I

- a) Distributed System
- b) Embedded System
- c) Network Security
- d) Networking Programming



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL (M.P.)

MCA-501 Data Warehousing and Mining

Unit-I

Motivation, importance, Data type for Data Mining: relation Databases, Data Warehouses, Transactional Databases, advanced database system and its applications, Data mining Functionalities: Concept/Class Description, Association Analysis classification & Prediction, Cluster Analysis, Outlier Analysis, Evolution Analysis, Classification of Data Mining Systems, Major Issues in Data Mining.

Unit-II

Data Warehouse and OLAP Technology for Data Mining: Differences between Operational Databases Systems and Data Warehouses, a multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Architecture, Data Warehouse Implementation, Data Cube Technology.

Unit-III

Data Preprocessing: Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization And Concept Hierarchy Generation. Data Mining Primitives, Languages, and System Architectures, Concept Description: Characterization and Comparison, Analytical Characterization.

Unit-IV

Mining Association Rules in Large Databases: Association Rule Mining: Market Basket Analysis, Basic Concepts, Mining Single-Dimensional Boolean Association Rules from Transactional Databases: the Apriori algorithm, Generating Association rules from Frequent items, Improving the efficiency of Apriori, Mining Multilevel Association Rules, Multidimensional Association Rules, Constraint-Based Association Mining.

Unit-V

Classification & Prediction and Cluster Analysis: Issues regarding classification & prediction, Different Classification Methods, Prediction, Cluster Analysis, Major Clustering Methods, Applications & Trends in Data Mining: Data Mining Applications, currently available tools.

Books

1. J. Han and M. Kamber, "Data Mining: Concepts and Techniques", Morgan Kaufmann Pub.
2. Berson "Dataware housing, Data Mining & DLAP, @004, TMH.
3. S.K. Pujari, "Data Mining Techniques", University Press, Hyderabad.



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL (M.P.)

MCA-502 Unix and Shell Programming

Unit-I

General Overview of the System: System structure, user perspective, O/S services assumption about Hardware The Kernel and buffer cache architecture of Unix O/S, System concepts, Kernel data Structure, System administration, Buffer headers, Structure of the buffer pool, Scenarios for retrieval of the buffer, Reading and writing disk block, Advantage and disadvantage of buffer cache.

Unit-II

Internal Representation of Files: INODES, Structure of regular, Directories conversions of a path name to an inode, Super block, Inode assignment to a new file, Allocation of disk blocks.

System Calls for the System: Open read write file and record close, File creation, Operation of special files change directory and change root, change owner and change mode, STAT and FSTAT, PIPES Mounting and unmounting files system, Link Unlink.

Unit-III

Structures of Processes and process control: Process states and transitions layout of system memory, the context of a process, manipulation of process address space, Sleep process creation/termination. The user Id of a process, changing the size of a process. The SHELL

Interprocess Communication and multiprocessor system: Process tracing system V IPO network communication sockets problem of multiprocessors systems, solution with master and hare process, and solution with semaphores.

Unit-IV

Introduction to shell scripts: shell Bourne shell, C shell, Unix commands, permissions, editors, filters sed, grep family, shell variables, scripts, metacharacters and environment, if and case statements, for while and until loops. Shell programming.

Unit-V

Awk and perl Programming: Awk pattern scanning and processing language, BEGIN and END patterns, Awk arithmetic and variables, Awk built in variable names and operators, arrays, strings, functions, perl; the chop() function, variable and operators, \$_ and \$. , Lists, arrays, regular expression and substitution, file handling, subroutines, formatted printing.

Linux:

History & Features of Linux, Linux structure, various flavours of linux.

Books

1. M.J. Bach “Design of UNIX O.S. “, Prentice Hall of India.
2. Y.Kanetkar “Unix shell programming”, BPB Pub.
3. Linux complete, BPB Publications
4. Sumitabha Das “ Unix concepts and Applications



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL (M.P.)

MCA-503 Cloud Computing

Unit-I

Introduction to Cloud Computing, Definition, Characteristics, Components, Cloud provider, SAAS, PAAS, IAAS and Others, Organizational scenarios of clouds, Administering & Monitoring cloud services, benefits and limitations, Deploy application over cloud, Comparison among SAAS, PAAS, IAAS Cloud computing platforms: Infrastructure as service: Amazon EC2, Platform as Service: Google App Engine, Microsoft Azure, Utility Computing, Elastic Computing.

Unit-II

Introduction to Cloud Technologies, Study of Hypervisors Compare SOAP and REST Web services, AJAX and mashups-Web services: SOAP and REST, SOAP versus REST, AJAX: asynchronous 'rich' interfaces, Mashups: user interface services Virtualization Technology: Virtual machine technology, virtualization applications in enterprises, Pitfalls of virtualization Multitenant software: Multi-entity support, Multi-schema approach, Multitenance using cloud data stores, Data access control for enterprise applications.

Unit-III

Data in the cloud: Relational databases, Cloud file systems: GFS and HDFS, Big Table, HBase and Dynamo. Map-Reduce and extensions: Parallel computing, The map-Reduce model, Parallel efficiency of Map-Reduce, Relational operations using Map-Reduce, Enterprise batch processing using Map-Reduce, Introduction to cloud development, Example/Application of Map reduce, Features and comparisons among GFS, HDFS etc, Map-Reduce model

Unit-IV

Cloud security fundamentals, Vulnerability assessment tool for cloud, Privacy and Security in cloud Cloud computing security architecture: Architectural Considerations- General Issues, Trusted Cloud computing, Secure Execution Environments and Communications, Micro-architectures; Identity Management and Access control Identity management, Access control, Autonomic Security Cloud computing security challenges: Virtualization security management virtual threats, VM Security Recommendations, VM-Specific Security techniques, Secure Execution Environments and Communications in cloud.

Unit-V

Issues in cloud computing, Implementing real time application over cloud platform Issues in Inter cloud Environments, QOS Issues in Cloud, Dependability, data migration, streaming in Cloud. Quality of Service (QoS) monitoring in a Cloud

Books

1. Google Apps by Scott Granneman, Pearson
2. Cloud Security & Privacy by Tim Malhar, S.Kumaraswamy, S.Latif (SPD, O'REILLY)
3. Cloud Computing : A Practical Approach, Antohy T Velte, et.al McGraw Hill,



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL (M.P.)

MCA-504 .Net Framework Technology

UNIT-I

Introduction to VB.NET, Event Driven Programming, NET as better Programming Platform NET Framework, NET Architecture, The Just-In-Time Compiler,. NET Framework class library introduction VB.NET Development Environment, Creating Applications, Building Projects Using simple components, Running VB.NET applications, Mastering VB Language. Data, Operators, Conditionals and Loops. Procedures, Error Handling, Classes and Objects.

UNIT-II

Windows Applications in VB .NET. Windows Forms, Text Boxes, Buttons, Labels, Check Boxes, and Radio Buttons. List Boxes, Combo Boxes. Picture Boxes, Scrollbars, Splitters, Timer Menus, Built-in Dialogs, Image List, Tree Views, List Views, Toolbars, Status Bar and Progress bars. Object Oriented Programming in VB .NET, Class and Object, Properties, methods and events. Constructors and Destructors.

UNIT-III

Method overloading, Inheritance, Access modifiers: Public, Private, Protected, Friend. Overloading and Overriding. Interfaces, Polymorphism.

UNIT-IV

File handling, File handling using File Stream, Stream Writer, Stream Reader, Binary Reader, Binary Writer classes, File and Directory Classes.

UNIT-V

Databases in VB .NET, Database: Connections, Data adapters, and datasets, Data Reader, Connection to database with server explorer Multiple Table Connection Data binding with controls like Text Boxes, List Boxes, Data grid etc. Navigating data source ,Data Grid View, Data form wizard, Data validation Connection Objects, Command Objects, Data Adapters, Dataset Class, Working with formula fields, Parameter fields, Group, Special fields, Working with Multiple Tables, SQL in Crystal Report, Report Temples.

BOOKS:

1. Programming Microsoft Visual Basic.NET – Francesco Balena
2. The Complete Reference -Visual Basic .NET – Jeffrey R. Shapiro
3. Visual Basic .NET 2003 in 21 Days. – Steven Holzner, SAMS Publications.
4. Crystal Report – The Complete Reference:-



MCA-505 Elective I : EI(a) : Distributed Systems

UNIT-I

Introduction to Distributed Systems: Goals of Distributed Systems, Hardware and Software concepts, The client server model, Remote procedure call, remote object invocation, message and stream oriented Communications.

UNIT-II

Process and synchronization in Distributed Systems: Threads, clients, servers, code migration, clock Synchronization, mutual exclusion, Bully and Ring Algorithm, Distributed transactions.

UNIT-III

Consistency, Replication, fault tolerance and security: Object replication, Data centric consistency Model, client-centric consistency models, Introduction to fault tolerance, process resilience, recovery, Distributed security architecture, security management, KERBEROS, secure socket layer, cryptography.

UNIT-IV

Distributed Object Based and File Systems: CORBA, Distributed COM, Goals and Design Issues of Distributed file system, types of distributed file system, sun network file system.

UNIT-V

Distributed shared memory, DSM servers, shared memory consistency model, distributed document Based systems: the world wide web, distributed co-ordination based systems: JINI Implementation: JAVA RMI, OLE, ActiveX, Orbix, Visbrokes, Object oriented programming with SOM

BOOKS

1. Andrew S. Tanenbaum, Maarten Van Steen “Distributed Systems Principles and Paradigms” Pearson Education Inc. 2002.
2. Lui “Distributed Computing Principles and Applications”.
3. George Coulios, “Distribute System: Design and Concepts”, Pearson Education



MCA-505 Elective I : EI(b) : Embedded Systems

UNIT-I

Princeton (Von Neumann) and Harvard Architecture, CISC and RISC architecture, General-purpose processor, microcontroller, Embedded processor, Digital Signal processor, Application specific processor, Super scalar, VLIW, pipelined Architecture. Definition of Embedded System, classification of embedded system, skills required for an Embedded System Designer, Trends in embedded system various examples of an embedded system, Challenges to design embedded system, embedded system development design methodology.

UNIT-II

Hardware units required to design embedded system like power source, clock oscillator circuit, Real time clock and timer, reset circuit, watchdog timer, memories, interrupts, DAC and ADC, LCD and LED display, PWM, Keypad/keyboard, pulse dialer, modem and transceiver.

UNIT-III

Embedded Software: Development tools for embedded software, Assemblers, Compilers, Editor, Interpreter, Cross Assembler, Simulator, Emulator, Locator, Linker, Profiler, Coding strategies for obtaining optimized time and space requirements, Debugging Embedded Software, Software in high level language, coding of software in machine language, Software for Device drivers and device management

UNIT-IV

Introduction to Real Time Operating System, comparison of RTOS with O.S., Tasks and Task States, Task and Data, Semaphores and Share data, Interrupt, Interrupt handler, Share data problem, Messages, Queue, Mailboxes and pipe. Introduction to U-COS II Real time operating system, main features of UCOS- II

UNIT-V

Embedded Communication System: Standard for Embedded Communication, USART, SPI, I2C, CAN, USB, Firewire, Ethernet, Wireless communication like IRDA, Bluetooth, 802.11, PCI Bus, SoC, IP Core, Case Study of Digital camera

BOOKS

1. Frank Vahid & Tony Givargis "Embedded System Design" John Wiley & Sons.
2. Dr. Rajkamal "Embedded System" TMH
3. Mark miller "VoIP" Wiley Dreamtech Publication



MCA-505 Elective I : EI(c) : Network Security

UNIT-I

Classical Encryption Techniques: Symantec Cipher model, substitution Techniques, transposition Techniques, rotor machines, steganography.

Block Ciphers and the Data Encryption standards: Simplified DES, block cipher principles, the data Encryption standard, the strength of DES, differential and linear cryptanalysis, block cipher design principles, block cipher modes of operation.

Advanced Encryption Standard: Evaluation Criteria for AES, the AES cipher.

Contemporary symmetric ciphers: Triple DES, blowfish.

Confidentiality using symmetric encryption: Placement of Encryption function, traffic confidentiality, key Distribution, and random number generation.

UNIT-II

Public key Encryption and Hash functions: Prime numbers, Fermat's and Euler's Theorems, testing for Primality, the Chinese remainder theorem, discrete logarithms.

Public key cryptography and RSA: Principles of Public key cryptosystems, the RSA algorithm.

Key Management other public key cryptosystems: Key management, diffie-Hallman key exchange, elliptic curve arithmetic, and elliptic curve cryptography.

UNIT-III

Message authentication and Hash function: Authentication Requirements, Authentication functions, message authentication codes, hash functions, security of hash function and MACs.

Hash Algorithms: MD5 message digest algorithm, secure Hash algorithm, ripemd-160, HMAC.

Digital Signature and Authentication protocols: Digital signatures, Authentication protocols, and digital signature standard.

Authentication Applications: Kerberos, X.509 Authentication service.

UNIT-IV

Electronic Mail Security: Pretty Good privacy, S/MIME.

IP Security: IP Security overview, IP security architecture, authentication header, encapsulating security payload, combining security associations, key management.

Web Security: Web security considerations, Secure sockets layer and transport layer security, secure electronic transaction

UNIT-V

Part four system security: Intruders, intrusion detection, and password

Management. Malicious software: Viruses and related threats, virus

Countermeasures. Firewalls: Firewall Design Principles, Trusted systems.

BOOKS

1. William Stallings "Cryptography and Network Security", 3 ed, Pearson Education.
2. W.Stallings " Network security Essential " Applications & Standards", Pearson ed.
3. Kanfren "Network Security : Private Communications in a public world 2/e
4. Eric Maiwald "Fundamentals of Network Security" Wiley India.



MCA-505 Elective I : EI(d) : Network Programming

UNIT-I

Communication protocol, Internet Protocols, Novell, System Network Architecture, UUCP, IPX/SPX for LANS, protocol comparisons.

UNIT-II

Berkeley sockets

Overview, UNIX domain protocols, socket address, socket system call, reserved ports, passing file descriptions, I/O asynchronous and multiplexing, socket implementation.

UNIT-III

Winsock programming

Using windows socket, API window socket and blocking I/O, other window extension, network Dependent UNRI, DLL. Sending and receiving data over connection/termination.

UNIT-IV

Novell IPX/SPX

Novell's windows drivers, netware C interface for windows, IPX/SPX procedure, datagram Communication, connection oriented communication with SPX, IPX/SPX implementation of DLL.

UNIT-V

Programming Applications

Time and data routines, trivial file transfer protocol, remote login.

BOOKS

1. Davis R, Windows Network Programming, Add Wesley.
2. Steven R, UNIX Network Programming, (Vol I & II) PHI.