MOBILE COMPUTING

Subject Code	
:	
	06CS831
IA Marks	
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25	
No. of Lecture Hrs./ Week	
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04	
Exam Hours	
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03	
Total No. of Lecture Hrs.	
:	
52	
Exam Marks	
:	
100	

PART - A

UNIT - 1

MOBILE DEVICES AND SYSTEMS, ARCHITECTURES: Mobile phones, Digital Music Players, Handheld Pocket Computers, Handheld Devices, Operating Systems, Smart Systems, Limitations of Mobile Devices, Automotive Systems. GSM – Services and System Architectures, Radio Interfaces, Protocols, Localization, Calling, Handover, General Packet Radio Service.

8 Hours

UNIT - 2

WIRELESS MEDIUM ACCESS CONTROL AND CDMA – BASED COMMUNICATION: Mediu m Access Control, Introduction to CDMA – based Systems, OFDM

6 Hours

UNIT - 3

MOBILE IP NETWORK LAYER, MOBILE TRANSPORT LAYER: IP and Mobile IP Network Layers Packet Delivery and Handover Management, Location Management, Registration, Tunneling and Encapsulation, Route Optimization, Dynamic Host Configuration Protocol.

Indirect TCP, Snooping TCP, Mobile TCP, Other Methods of TCP – layer Transmission for Mobile Networks.

7 Hours

UNIT - 4

DATABASES: Database Hoarding Techniques, Data Caching, Client – Server Computing and Adaptation, Transactional Models, Query Processing, Data Recovery Process, Issues relating to Quality of Service.

5 Hours

PART - B

UNIT - 5

DATA DISSEMINATION AND BROADCASTING SYSTEMS: Communication Asymmetry, Classification of Data – Delivery Mechanisms, Data Dissemination Broadcast Models, Selective Tuning and Indexing Techniques, Digital Audio Broadcasting, Digital video Broadcasting.

5 Hours

UNIT - 6

DATA SYNCHRONIZATION IN MOBILE COMPUTING SYSTEMS: Synchronization, Synchronization Protocols, SyncML – Synchronization Language for Mobile Computing, Synchronized Multimedia Markup Language (SMIL).

6 Hours

UNIT - 7

MOBILE DEVICES, SERVER AND MANAGEMENT, WIRELESS LAN, MOBILE INTERNET CONNECTIVITY AND PERSONAL AREA NETWORK: Mobile agent, Application Server, Gateways, Portals, Service Discovery, Device Management, Mobile File Systems.

Wireless LAN (WiFi) Architecture and Protocol Layers, WAP 1.1 and WAP 2.0 Architectures, Bluetooth – enabled Devices Network, Zigbee.

8 Hours

UNIT - 8

MOBILE APPLICATION LANGUAGES – XML, JAVA, J2ME AND JAVACARD, MOBILE OPERATING SYSTEMS: Introduction, XML, JAVA, Java 2 Micro Edition (J2ME), JavaCard. Operating System, PalmOS, Windows CE, Symbian OS, Linux for Mobile Devices.

7 Hours

TEXT BOOK:

1. **Mobile Computing** – Raj Kamal, Oxford University Press, 2007.

REFERENCE BOOKS:

1. **Mobile Computing: Technology, Applications and Service Creation,** Asoke K. Talkukder, Roopa R Yavaga, Tata McGraw Hill, 2005.

2. **Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML** , Reza B'Far, 5th Edition, Cambridge University press, 2006.

3. **Principles of Mobile Computing** – Uwe Hansmann, Lothat Merk, Martin S Nicklous

and Thomas Stober, 2nd Edition, Springer International Edition, 2003.

4. **Mobile Communication** – Schiller, Pearson Education, 2004.

WEB 2.0 AND RICH INTERNET APPLICATIONS

Subject Code	
:	
06CS832	
IA Marks	
:	

25

No. of Lecture Hrs./ Week

:

04

Exam Hours

:

03

Total No. of Lecture Hrs.

:

52

Exam Marks

:

100

PART - A

UNIT - 1

INTRODUCTION, WEB SERVICES: What is Web 2.0?, Folksonomies and Web 2.0, Software as a Service (SaaS), Data and Web 2.0, Convergence, Iterative development, Rich User experience, Multiple Delivery Channels, Social Networking. Web Services: SOAP, RPC Style SOAP, Document style SOAP, WSDL, REST services, JSON format, What is JSON?, Array literals, Object literals, Mixing literals, JSON Syntax, JSON Encoding and Decoding, JSON versus XML.

7 Hours

UNIT - 2

BUILDING RICH INTERNET APPLICATIONS WITH AJAX-1: Building Rich Internet Applications with AJAX: Limitations of Classic Web application model, AJAX principles, Technologies behind AJAX, Examples of usage of AJAX, Dynamic web applications through Hidden frames for both GET and POST methods.

7 Hours

UNIT - 3

BUILDING RICH INTERNET APPLICATIONS WITH AJAX-2: Frames, Asynchronous communication and AJAX application model,

XMLHTTP Object – properties and methods, handling different browser implementations of XMLHTTP, The same origin policy, Cache control, AJAX Patterns (Only algorithms – examples not required): Predictive fetch pattern, Submission throttling pattern, Periodic refresh, Multi stage download, Fall back patterns.

6 Hours

UNIT - 4

BUILDING RICH INTERNET APPLICATIONS WITH FLEX - 1: lash player, Flex framework, MXML and Actionscript, Working with Data services, Understanding differences between HTML and Flex applications, Understanding how Flex applications work, Understanding Flex and Flash authoring, MXML language, a simple example.

6 Hours

PART - B

UNIT - 5

BUILDING RICH INTERNET APPLICATIONS WITH FLEX - 2: Using Actionscript, MXML and Actionscript correlations. Understanding Actionscript 3.0 language syntax: Language overview, Objects and Classes, Packages and namespaces, Variables & scope of variables, case sensitivity and general syntax rules, Operators, Conditional, Looping, Functions, Nested functions, Functions as Objects, Function scope, OO Programming in Actionscript: Classes,

Interfaces, Inheritance, Working with String objects, Working with Arrays, Error handling in Actionscript: Try/Catch, Working with XML

6 Hours

UNIT - 6

BUILDING RICH INTERNET APPLICATIONS WITH FLEX - 3: Framework fundamentals, Understanding application life cycle, Differentiating between Flash player and Framework, Bootstrapping Flex applications, Loading one flex application in to another, Understanding application domains, Understanding the preloader. Managing layout, Flex layout overview, Working with children, Container types, Layout rules, Padding, Borders and gaps, Nesting containers, Making fluid interfaces.

6 Hours

UNIT - 7

BUILDING RICH INTERNET APPLICATIONS WITH FLEX – 4: Working with UI components: Understanding UI Components, Creating component instances, Common UI Component properties, Handling events, Button, Value selectors, Text components, List based controls, Data models and Model View Controller, Creating collection objects, Setting the data provider, Using Data grids, Using Tree controls, Working with selected values and items, Pop up controls, Navigators, Control bars Working with data: Using data models, Using XML, Using Actionscript classes, Data Binding.

6 Hours

UNIT - 8

BUILDING ADVANCED WEB 2.0 APPLICATIONS: Definition of mash up applications, Mash up Techniques, Building a simple mash up application with AJAX, Remote data communication, strategies for data communication, Simple HTTPServices, URLLoader in Flex, Web Services in Flex, Examples: Building an RSS reader with AJAX, Building an RSS reader with Flex.

8 Hours

TEXT BOOKS:

1. **Professional AJAX** – Nicholas C Zakas et al, Wrox publications, 2006.

2. **Programming Flex 2** – Chafic Kazoun, O'Reilly publications, 2007.

3. **Mashups** – Francis Shanahan, Wrox, 2007.

REFERENCE BOOKS:

1. **Ajax: The Complete Reference** – Thomas A. Powel, McGraw Hill, 2008.

2. **Unleashing Web 2.0: From Concepts to Creativity** – Gottfried Vossen, Stephan Hagemann, Elsevier, 2007.

3. **Essential Actionscript 3.0** – Colin Moock, O'Reilly Publications, 2007.

4. **Ajax Bible** - Steven Holzner, Wiley India, 2007.

5. **A Web 2.0 Primer Pragmatic Ajax** – Justin Gehtland et al, SPD Publications, 2006.

6. **Professional Web 2.0 Programming** – Eric Van derVlist et al, Wiley India, 2007.

STORAGE AREA NETWORKS

Subject Code	
:	
06CS833	
IA Marks	
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25	
No. of Lecture Hrs./ Week	
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04	
Exam Hours	
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03	
Total No. of Lecture Hrs.	:
52	
Exam Marks	:
100	

PART- A

UNIT - 1

INTRODUCTION: Server Centric IT Architecture and its Limitations; Storage – Centric IT Architecture and its advantages; Case study: Replacing a server with Storage Networks; The Data Storage and Data Access problem; The Battle for size and access.

6 Hours

UNIT - 2

INTELLIGENT DISK SUBSYSTEMS - 1: Architecture of Intelligent Disk Subsystems; Hard disks and Internal I/O Channels, JBOD, Storage virtualization using RAID and different RAID levels;

6 Hours

UNIT - 3

INTELLIGENT DISK SUBSYSTEMS – 1, I/O TECHNIQUES - 1: Caching: Acceleration of Hard Disk Access; Intelligent disk subsystems; Availability of disk subsystems. The Physical I/O path from the CPU to the Storage System; SCSI.

7 Hours

UNIT - 4

I/O TECHNIQUES – 2, NETWORK ATTACHED STORAGE: Fibre Channel Protocol Stack; Fibre Channel SAN; IP Storage. The NAS Architecture, The NAS hardware Architecture, The NAS Software Architecture, Network connectivity, NAS as a storage system.

7 Hours

PART- B

UNIT - 5

FILE SYSTEM AND NAS: Local File Systems; Network file Systems and file servers; Shared Disk file systems; Comparison of fibre Channel and NAS.

6 Hours

UNIT - 6

STORAGE VIRTUALIZATION: Definition of Storage virtualization; Implementation Considerations; Storage virtualization on Block or file level; Storage virtualization on various levels of the storage Network; Symmetric and Asymmetric storage virtualization in the Network

6 Hours

UNIT - 7

SAN ARCHITECTURE AND HARDWARE DEVICES: Overview, creating a Network for storage; SAN Hardware devices, The fibre channel switch, Host Bus adaptors; Putting the storage in SAN; Fabric operation from a Hardware perspective.

7 Hours

UNIT - 8

SOFTWARE COMPONENTS OF SAN: The switch's Operating system, Device Drivers, The Supporting the switch's components, Configuration options for SANs. Panning for business continuity.

7 Hours

TEXT BOOKS:

1. **Storage Networks Explained** – Ulf Troppens, Rainer Erkens and Wolfgang Muller, John Wiley & Sons, 2003.

2. **Storage Networks: The Complete Reference** – Robert Spalding, Tata McGraw Hill, 2003.

REFERENCE BOOKS:

1. **Storage Area Network Essentials: A Complete Guide to understanding and Implementing SANs** – Richard Barker and Paul Massiglia, John Wiley India, 2002.

2. **Storage Networking Fundamentals** Marc Farley, Cisco Press, 2005.

NETWORK MANAGEMENT SYSTEMS

Subject Code	
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06CS834	□□ □□
IA Marks	
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25	
No. of Lecture Hrs./ Week	
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04	

Exam Hours

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03

Total No. of Lecture Hrs.

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52

Exam Marks

:

100

PART - A

UNIT - 1

INTRODUCTION: Analogy of Telephone Network Management, Data and Telecommunication Network Distributed computing Environments, TCP/IP-Based Networks: The Internet and Intranets, Communications Protocols and Standards- Communication Architectures, Protocol Layers and Services; Case Histories of Networking and Management – The Importance of topology , Filtering Does Not Reduce Load on Node, Some Common Network Problems; Challenges of Information Technology Managers, Network Management: Goals, Organization, and Functions- Goal of Network Management, Network Provisioning, Network Operations and the NOC, Network Installation and Maintenance; Network and System Management, Network Management System platform, Current Status and Future of Network Management.

7 Hours

UNIT - 2□□□

BASIC FOUNDATIONS: STANDARDS, MODELS, AND LANGUAGE:

Network Management Standards, Network Management Model, Organization Model, Information Model – Management Information Trees, Managed Object Perspectives, Communication Model; ASN.1- Terminology, Symbols, and Conventions, Objects and Data Types, Object Names, An Example of ASN.1 from ISO 8824; Encoding Structure; Macros, Functional Model.

6 Hours

UNIT - 3□□□

SNMPV1 NETWORK MANAGEMENT - 1: Managed Network: The History of SNMP Management, Internet Organizations and standards, Internet Documents, The SNMP Model, The Organization Model, System Overview.

6 Hours

UNIT - 4

SNMPV1 NETWORK MANAGEMENT – 2: The Information Model – Introduction, The Structure of Management Information, Managed Objects, Management Information Base. The SNMP Communication Model – The SNMP Architecture, Administrative Model, SNMP Specifications, SNMP Operations, SNMP MIB Group, Functional Model.

7 Hours

PART - B

UNIT - 5

SNMP MANAGEMENT – RMON: Remote Monitoring, RMON SMI and MIB, RMONI1- RMON1 Textual Conventions, RMON1 Groups and Functions, Relationship Between Control and Data Tables, RMON1 Common and Ethernet Groups, RMON Token Ring Extension Groups, RMON2 – The RMON2 Management Information Base, RMON2 Conformance Specifications; ATM Remote Monitoring, A Case Study of Internet Traffic Using RMON.

6 Hours

UNIT - 6

BROADBAND NETWORK MANAGEMENT: ATM NETWORKS: Broadband Networks and Services, ATM Technology – Virtual Path-Virtual Circuit, TM Packet Size, Integrated Service, SONET, ATM LAN Emulation, Virtual LAN; ATM Network Management – The ATM Network Reference Model, The Integrated Local Management Interface, The ATM Management Information Base, The Role of SNMP and ILMI in ATM Management, M1 Interface: Management of ATM Network Element, M2 Interface: Management of Private Networks, M3 Interface: Customer Network Management of Public Networks, M4 Interface: Public Network Management, Management of LAN Emulation, ATM Digital Exchange Interface Management.

6 Hours

UNIT - 7

BROADBAND NETWORK MANAGEMENT: Broadband Access Networks and Technologies – Broadband Access Networks, roadband Access Technology; HFCT Technology – The Broadband LAN, The Cable Modem, The Cable Modem Termination System,

The HFC Plant, The RF Spectrum for Cable Modem; Data Over Cable Reference Architecture; HFC Management – Cable Modem and CMTS Management, HFC Link Management, RF Spectrum Management, DSL Technology; Asymmetric Digital Subscriber Line Technology – Role of the ADSL Access Network in an Overall Network, ADSL Architecture, ADSL Channeling Schemes, ADSL Encoding Schemes; ADSL Management – ADSL Network Management Elements, ADSL Configuration Management, ADSL Fault Management, ADSL Performance Management, SNMP-Based ADSL Line MIB, MIB Integration with Interfaces Groups in MIB-2, ADSL Configuration Profiles.

6 Hours

UNIT - 8

Network Management Applications: Configuration Management- Network Provisioning, Inventory Management, Network Topology, Fault Management- Fault Detection,

Fault Location and Isolation Techniques, Performance Management – Performance Metrics, Data Monitoring, Problem Isolation, Performance Statistics; Event Correlation Techniques – Rule-Based Reasoning, Model-Based Reasoning, Case-Based Reasoning, Codebook correlation Model, State Transition Graph Model, Finite State Machine Model, Security Management – Policies and Procedures, Security Breaches and the Resources Needed to Prevent Them, Firewalls, Cryptography, Authentication and Authorization, Client/Server Authentication Systems, Messages Transfer Security, Protection of Networks from Virus Attacks, Accounting Management, Report Management, Policy-Based Management, Service Level Management.

8 Hours

TEXT BOOK:

1. **Network Management: Principles and Practice** – Mani Subramanian, Pearson Education, 2003.

REFERENCE BOOK:

1. **Network Management Concepts and Practices** – J. Richard Burke, A Hands-On Approach, PHI, 2008.

INFORMATION AND NETWORK SECURITY

Subject Code	
:	
06CS835	

IA Marks	
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25	

No. of Lecture Hrs./	Week
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04	

Exam Hours	
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03	

Total No. of Lecture Hrs.

:

52

Exam Marks

:

100

PART - A

UNIT - 1

PLANNING FOR SECURITY: Introduction; Information Security Policy, Standards, and Practices; The Information Security Blue Print; Contingency plan and a model for contingency

plan.

6 Hours

UNIT - 2

SECURITY TECHNOLOGY-1: Introduction; Physical design; Firewalls; Protecting Remote Connections.

6 Hours

UNIT - 3

SECURITY TECHNOLOGY - 2: Introduction; Intrusion Detection Systems (IDS); Honey Pots, Honey Nets, and Padded cell systems; Scanning and Analysis Tools.

6 Hours

UNIT - 4

CRYPTOGRAPHY: Introduction; A short History of Cryptography; Principles of Cryptography; Cryptography Tools; Attacks on Cryptosystems.

8 Hours

PART - B

UNIT - 5

INTRODUCTION TO NETWORK SECURITY, AUTHENTICATION APPLICATIONS: Attacks , services, and Mechanisms; Security Attacks; Security Services;

A model for Internetwork Security; Internet Standards and RFCs. Kerberos, X.509 Directory Authentication Service.

8 Hours

UNIT - 6

ELECTRONIC MAIL SECURITY: Pretty Good Privacy (PGP); S/MIME.

6 Hours

UNIT - 7

IP SECURITY: IP Security Overview; IP Security Architecture; Authentication Header; Encapsulating Security Payload; Combining Security Associations; Key Management.

6 Hours

UNIT - 8

WEB SECURITY: Web security requirements; Secure Socket layer (SSL) and Transport layer Security (TLS); Secure Electronic Transaction (SET).

6 Hours

TEXT BOOKS:

1. **Principles of Information Security** – Michael E. Whitman and Herbert J. Mattord, 2nd Edition, Thomson, 2005.

2. **Applications and Standards** – Network Security Essentials, William Stallings, Pearson Education, 2000.

REFERENCE BOOK:

1. **Cryptography and Network Security** – Behrouz A. Forouzan, Tata McGraw-Hill, 2007.

Subject Code	
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06CS836	
IA Marks	
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25

No. of Lecture Hrs./ Week

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04

Exam Hours

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03

Total No. of Lecture Hrs.

:

52

Exam Marks

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100

PART - A

UNIT - 1

INTRODUCTION, 8051 ASSEMBLY LANGUAGE PROGRAMMING – 1: Microcontrollers and embedded processors; Overview of the 8051 family.

8051 Assembly Language Programming (ALP) -1: Inside the 8051; Introduction to 8051 ALP; Assembling and running an 8051 program; The PC and ROM space in 8051; Data types, directives, flag bits, PSW register, register banks, and the stack.

7 Hours

UNIT - 2

ALP – 2: Jump and loop instructions; Call instructions; Time delay for various 8051 family members; I/O programming; I/O bit manipulation programming. Immediate and register addressing modes; Accessing memory using various addressing modes.

6 Hours

UNIT - 3

ALP – 3, PROGRAMMING IN C: Bit addresses for I/O and RAM; Extra 128 bytes of on-chip RAM in 8052. Arithmetic instructions; Signed numbers and arithmetic operations; Logic and compare instructions; rotate instruction and serialization; BCD, ASCII, and other application programs. rogramming in C: Data types and time delays; I/O programming; Logic operations; Data conversion programs; Accessing code ROM space; Data serialization.

7 Hours

UNIT - 4

PIN DESCRIPTION, TIMER PROGRAMMING: Pin description of 8051; Intel Hex file; Programming the 8051 timers; Counter programming; rogramming Timers 0 and 1 in C.

6 Hours

PART - B

UNIT - 5

SERIAL PORT PROGRAMMING, INTERRUPT PROGRAMMING: basics of serial communications; 8051 connections to RS232; Serial port programming in assembly and in C. 8051 interrupts; Programming timer interrupts; Programming external hardware interrupts; Programming the serial communications interrupt; Interrupt priority in 8051 / 8052; Interrupt programming in C.

6 Hours

UNIT - 6

INTERFACING LCD, KEYBOARD, ADC, DAC AND SENSORS: LCE interfacing; Keyboard interfacing; Parallel and serial ADC; DAC interfacing; Sensor interfacing and signal conditioning.

7 Hours

UNIT - 7

INTERFACING TO EXTERNAL MEMORY, INTERFACING WITH 8255: Memory address decoding; Interfacing 8031 / 8051 with external ROM; 8051 data memory space; Accessing external data memory in C. Interfacing with 8255; Programming 8255 in C.

7 Hours

UNIT - 8

DS12887 RTC INTERFACING AND PROGRAMMING, APPLICATIONS: DS12887 RTC interfacing; DS12887 RTC programming in C; Alarm, SQW, and IRQ features of DS12886. Relays and opto-isolators; Stepper motor interfacing; DC motor interfacing and PWM.

6 Hours

TEXT BOOK:

1. **The 8051 Microcontroller and Embedded Systems using Assembly and C –** Muham

mad Ali Mazidi, Janice Gillispie Mazidi, Rolin D. McKinlay, 2nd Edition, Pearson Education, 2008.

REFERENCE BOOKS:

1. **Microcontrollers Architecture, Programming, Interfacing and System Design** – Raj Kamal, Pearson Education, 2007.

2. **Microcontrollers and Applications –** Dr. Ramani Kalpathi, Ganesh Raja, 1st Revised Edition, Sanguine Technical Publishers, 2007.