MASTERS OF TECHNOLOGY (INFORMATION TECHNOLOGY & CYBER WARFARE)

(1st YEAR)

Total Contact Hours = 24 **Total Marks = 900** **Total Credits = 22**

SEMESTER 1st		Contact Hrs			Marks			Credits
Subject Code	**Subject Name**	**L**	**T**	**P**	**Int.**	**Ext.**	**Total**	
MITE3-101	Information Security	3	1	0	50	100	150	4
MITE3-102	Advance Database Systems	3	1	0	50	100	150	4
MITE3-103	Ethical Hacking	3	1	0	50	100	150	4
MITE3-104	Research Lab - I	0	0	4	50	100	150	2
Departmental Elective – I (Select any one)		3	1	0	50	100	150	4
MITE3-156	Mobile Computing							
MITE3-157	Mobile Application Development							
MITE3-158	Real Time & Embedded Systems							
Departmental Elective – II (Select any one)		3	1	0	50	100	150	4
MITE3-159	Advance Software Engineering							
MITE3-160	Object Oriented Analysis & Design							
MITE3-161	Advanced Internet & Web Technologies							
Total	**Theory = 5 Lab = 1**	**15**	**5**	**4**	**300**	**600**	**900**	**22**

INFORMATION SECURITY

Subject Code – MITE3- 101 **L T P C** **Duration – 45 Hrs**

3 1 0 4

UNIT-I (12 Hrs.)

Information Security: Introduction, History of Information security, what is Security, CNSS Security Model, Components of Information System, Balancing Information Security and Access, Approaches to Information Security Implementation, The Security Systems Development Life Cycle.

UNIT-II (11 Hrs.)

Cryptography: Concepts and Techniques, Symmetric and Asymmetric Key cryptography, steganography, **Symmetric key Ciphers:** DES Structure, DES Analysis, Security of DES, Variants of DES, Block Cipher Modes of Operation, AES Structure, Analysis of AES, Key Distribution **Asymmetric Key Ciphers:** Principles of Public Key Cryptosystems, RSA Algorithm, Analysis of RSA, Diffie-Hellman Key exchange

UNIT-III (10 Hrs.)

Message Authentication and Hash Functions: Authentication requirements and functions, MAC and Hash Functions, **MAC Algorithms**: Secure Hash Algorithm, Whirlpool, HMAC, Digital signatures, X.509, Kerberos.

UNIT-IV (12 Hrs.)

Security at layers (Network, Transport, Application): IPSec, Secure Socket Layer(SSL), Transport Layer Security(TLS), Secure Electronic Transaction(SET), Pretty Good Privacy (PGP), S/MIME **Intruders, Virus and Firewalls:** Intruders, Intrusion detection, password management, Virus and related threats, Countermeasures, Firewall design principles, Types of firewalls

Recommended Books

1. Michael E. Whitman, Herbert J. Mattord, 'Principles of Information Security', 4th Edn., CENGAGE Learning.
2. William Stallings, 'Cryptography and Network Security', 4th Edn., Pearson Education.
3. Forouzan Mukhopadhyay, 'Cryptography and Network Security', 2nd Edn., Mc Graw Hill.
4. C.K. Shyamala, N. Harini, Dr. T.R. Padmanabhan, 'Cryptography and Network Security', 1st Edn., Wiley India.
5. Bernard Menezes, 'Network Security and Cryptography', CENGAGE Learning.
6. Atul Kahate, 'Cryptography and Network Security', 2nd Edn., Mc Graw Hill.
7. W.M. Arthur Conklin, Greg White, 'Principles of Computer Security', Tata McGraw Hill.

ADVANCED DATABASE SYSTEM

Subject Code – MITE3-102 **L T P C** **Duration - 45 Hrs**

3 1 0 4

UNIT-I (12 Hrs)

Parallel Databases: Database System Architectures: Centralized and Client-Server Architectures – Server System Architectures – Parallel Systems- Distributed Systems – Parallel Databases: I/O Parallelism – Inter and Intra Query Parallelism – Inter And Intra Operation Parallelism – Case Studies.

UNIT-II (13 Hrs)

Object Oriented Database: Object Oriented Databases – Introduction – Weakness of RDBMS – Object Oriented Concepts Storing Objects in Relational Databases – Next Generation Database Systems – Object Oriented Data models – OODBMS Perspectives – Persistence – Issues in OODBMS – Object Oriented Database Management System Manifesto – Advantages and Disadvantages of OODBMS – Object Oriented Database Design

– OODBMS Standards and Systems – Object Management Group – Object Database Standard ODMG – Object Relational DBMS –Postgres - Comparison of ORDBMS and OODBMS.

UNIT-III (11 Hrs)

Web Database: Web Technology and DBMS – Introduction – The Web – The Web as a Database Application Platform – Scripting languages – Common Gateway Interface – HTTP Cookies – Extending the Web Server – Java – Microsoft's Web Solution Platform– Oracle Internet Platform – Semi structured Data and XML – XML Related Technologies – XML Query Languages.

UNIT-IV (10 Hrs)

Intelligent Database: Enhanced Data Models for Advanced Applications – Active Database Concepts and Triggers – Temporal Database Concepts – Deductive databases – Knowledge Databases. **Current Trends:** Mobile Database – Geographic Information Systems – Genome Data Management – Multimedia Database – Parallel Database – Spatial Databases - Database administration – Data Warehousing and Data Mining.

Recommended Books

1. Thomas M. Connolly, Carolyn E. Begg, 'Database Systems - A Practical Approach to Design, Implementation, and Management', 3rd Edn., Pearson Education, **2003.**
2. Ramez Elmasri & Shamkant B. Navathe, 'Fundamentals of Database Systems', 4th Edn., Pearson Education, **2004.**
3. Tamer Ozsu M., Patrick Ualduriel, 'Principles of Distributed Database Systems', 2nd Edn., Pearson Education, **2003.**
4. C.S.R. Prabhu, 'Object Oriented Database Systems', PHI, **2003.**
5. Peter Rob and Corlos Coronel, 'Database Systems – Design, Implementation and Management'.

ETHICAL HACKING

Subject Code – MITE3-103 **L T P C** **Duration – 45 Hrs**

3 1 0 4

UNIT-I (12 Hrs)

Introduction to Ethical hacking: Terminology, Ethical hacking versus auditing, Nontechnical attacks, Network attacks, operating system attacks, Application attacks, Ethical hacking process, social engineering, physical security, Passwords.

UNIT-II (12 Hrs)

Hacking: Hacking windows, Network hacking, Web hacking, Password hacking, Hardware hacking, Virtual Private Network hacking, Study of various attack: Input validation attacks, SQL injection attacks, Buffer overflow attacks, Privacy attacks, VoIP attacks.

UNIT-III (10 Hrs)

Hacking TCP/IP: Checksums, IP spoofing, port scanning, DNS spoofing, DOS attacks: SYN attacks, Smurf attacks, UDP flooding, DDOS – Models.

UNIT-IV (11 Hrs)

Wireless Hacking: Wireless Footprint, Wireless Scanning and Enumeration, Wireless Network Defense and Counter Measures, Gaining Access (Hacking 802.11), WEP, WPA Web Hacking: Web Server Hacking, Web Application Hacking. Firewall Identification, Scanning Through Firewalls, Packet Filtering, Application Proxy Vulnerabilities, Denial of Service Attacks, Motivation of Dos Attackers, Types of Dos Attacks, Generic Dos Attacks, UNIX and Windows Dos.

Recommended Books

1. A. Fadia, 'An Unofficial Guide to Ethical Hacking', 2nd Edn.. Mac Millan, **2010.**
2. K. Beaver and S. McClure, 'Hacking for Dummies', 3rd Edn., John Wiley & Sons, **2010.**

3. Stuart McClure, Joel Scambray and Goerge Kurtz, 'Hacking Exposed Network Security Secrets & Solutions', 5th Edn., Tata Mc Graw Hill Publishers, **2010.**

MOBILE COMPUTING

Subject Code – MITE3-156 **L T P C** **Duration - 45 Hrs**

3 1 0 4

UNIT-I (10 Hrs)

Introduction: Mobile Communications, Mobile Computing – Paradigm, Promises/Novel Applications and Impediments and Architecture; Mobile and Handheld Devices, Limitations of Mobile and Handheld Devices. GSM – Services, System Architecture, Radio Interfaces, Protocols, Localization, Calling, Handover, Security, New Data Services, GPRS, CSHSD, DECT.

UNIT – II (12 Hrs)

(Wireless) Medium Access Control (MAC): Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA, Wireless LAN/(IEEE 802.11) **Mobile Network Layer:** IP and Mobile IP Network Layers, Packet Delivery and Handover Management, Location Management, Registration, Tunnelling and Encapsulation, Route Optimization, DHCP.

UNIT-III (10 Hrs)

Mobile Transport Layer: Conventional TCP/IP Protocols, Indirect TCP, Snooping TCP, Mobile TCP, Other Transport Layer Protocols for Mobile Networks. **Database Issues:** Database Hoarding & Caching Techniques, Client- Server Computing & Adaptation, Transactional Models, Query processing, Data Recovery Process & QoS Issues.

UNIT-IV (13 Hrs)

Data Dissemination and Synchronization: Communications Asymmetry, Classification of Data Delivery Mechanisms, Data Dissemination, Broadcast Models, Selective Tuning and Indexing Methods, Data Synchronization – Introduction, Software, and Protocols **Mobile Ad hoc Networks (MANETs):** Introduction, Applications & Challenges of a MANET, Routing, Classification of Routing Algorithms, Algorithms such as DSR, AODV, DSDV, Mobile Agents, Service Discovery. **Protocols and Platforms for Mobile Computing:** WAP, Bluetooth, XML, J2ME, Java Card, Palm OS, Windows CE, Symbian OS, Linux for Mobile Devices, Android.

Recommended Books

1. Jochen Schiller, 'Mobile Communications', 2nd Edn., Addison Wesely, Pearson Education.
2. Raj Kamal, 'Mobile Computing", Oxford University Press, **2007.**
3. Mazliza Othman, 'Principles of Mobile Computing and Communications', Auerbach Publications.
4. William Stallings, 'Wireless Communications and Networks', Prentice Hall, **2005.**
5. M. Richharia, 'Mobile Satellite Communication: Principles and Trends', Pearson Education.

MOBILE APPLICATION DEVELOPMENT

Subject Code – MITE3-157 **L T P C** **Duration - 45 Hrs**

3 1 0 4

UNIT-I (10 Hrs)

Introduction: Mobile Development Importance, Survey of mobile based application development, Mobile myths, third party frameworks, Mobile Web Presence and

Applications, creating consumable web services for mobile, JSON, Debugging Web Services, Mobile Web Sites, Starting with Android mobile Applications.

UNIT-II (13 Hrs)

Mobile Web: Introduction, WAP1, WAP2, Fragmentation Display, Input Methods, Browsers and Web Platforms, Tools for Mobile Web Development. **Application Architectures and Designs:** Mobile Strategy, Navigation, Design and User Experience, WML, XHTML Mobile Basics, Mobile HTML5, CSS for Mobile, WCSS extensions, CSS3, CSS for mobile browsers, HTML5 Compatibility levels, Basics of Mobile **HTML5:** Document Head, Document Body, HTML5 Mobile Boilerplate, the Content, HTML5 Forms: Design, Elements, Attributes, Validation.

UNIT-III (10 Hrs)

Devices, Images, Multi-Media: Device Detection, Client-side Detection, Server-side Detection, Device Interaction, Images, Video, Audio, Debugging and Performance, Content Delivery, Native and Installed Web Apps.

UNIT-IV (12 Hrs)

Advanced Tools & Techniques: J2ME programming basics, HTML5 Script Extensions, Code Execution, Cloud based browsers, JS Debugging and pro ling, Background Execution, Supported Technologies and API, Standard JavaScript Behaviour, Java Libraries, Mobile Libraries, UI Frameworks: Sencha Touch, JQuery Mobile, Enyo, Montage, iUI, jQTouch, JavaScript Mobile UI Pattern **Advanced Applications:** Geolocation and Maps app, Online Apps, Storage, and Networks, Distribution and Social Web 2.0.

Recommended Books

1. Je McWherter, Scott Gowell, 'Professional Mobile Application Development', John Wiley & Sons.
2. Maximiliano Firtman, 'Programming the Mobile Web', 2nd Edition, Oreilly, **2013.**
3. Digital Content: http://en.wikibooks.org/wiki/Category: J2ME Programming
4. Android Studio Development Essentials, Ref: http://www.techotopia.com/

REAL TIME & EMBEDDED SYSTEMS

Subject Code – MITE3-158 **L T P C** **Duration - 45 Hrs**

3 1 0 4

UNIT-I (12 Hrs)

Introduction to Embedded Systems: Definition of Embedded System, Embedded Systems Vs General Computing Systems, History of Embedded Systems, Classification, Major Application Areas, Purpose of Embedded Systems, Characteristics and Quality Attributes of Embedded Systems, Design cycle in the development phase for an embedded system, Use of software tools for development of an ES.

UNIT-II (12 Hrs)

Typical Embedded System: Core of the Embedded System: General Purpose and Domain Specific Processors, ASICs, PLDs, Commercial Off-The-Shelf Components (COTS), Memory: ROM, RAM, Memory according to the type of Interface, Memory Shadowing, Memory selection for Embedded Systems, Sensors and Actuators, Communication Interface: Onboard and External Communication Interfaces.

UNIT-III (11 Hrs)

Embedded Firmware: Reset Circuit, Brown-out Protection Circuit, Oscillator Unit, Real Time Clock, Watchdog Timer, Embedded Firmware Design Approaches and Development Languages. **RTOS Based Embedded System Design:** Operating System Basics, Types of Operating Systems, Tasks, Process and Threads, Multiprocessing and Multitasking, Task Scheduling.

UNIT-IV (10 Hrs)

Task Communication: Shared Memory, Message Passing, Remote Procedure Call and Sockets, Task Synchronization: Task Communication/Synchronization Issues, Task Synchronization Techniques, Device Drivers, how to Choose an RTOS.

Recommended Books

1. K.V. Shibu, 'Introduction to Embedded Systems', McGraw Hill Publications.
2. Raj Kamal, 'Embedded Systems', Tata McGraw Hill.
3. Frank Vahid, Tony Givargis, 'Embedded System Design', John Wiley.
4. Lyla, 'Embedded Systems', Pearson Education, **2013.**
5. David E. Simon, 'An Embedded Software Primer', Pearson Education.

ADVANCED SOFTWARE ENGINEERING

Subject Code – MITE3-159 **L T P C** **Duration - 45 Hrs**

3 1 0 4

UNIT-I (12 Hrs)

Principles and Motivations: History, Definitions; Engineering Approaches to Software Development: Software Development Process Models from The Points of View of Technical Development and Project Management: Waterfall, Rapid Prototyping, Incremental Development, Spiral Models, Agile Software Development, Emphasis on Computer-Assisted Environments. Selection of Appropriate Development Process. **Software Development Methods**: Formal, Semi-Formal and Informal Methods; Requirements elicitation, requirements specification; Data, Function and Event Based Modelling; Some of the popular methodologies such as Your dons SAD, SSADM etc; CASE Tools-Classification, Features, Strengths and Weaknesses; ICASE; CASE standards.

UNIT-II (11 Hrs)

Software Project Management: Principles of Software Projects Management; Organizational and Team Structure; Project Planning; Project Initiation and Project Termination, Technical, Quality, and Management Plans; Project Control; Cost Estimation Methods: Function Points and COCOMO.

UNIT-III (11 Hrs)

Software Quality Management: Quality Control, Quality Assurance and Quality Standards with Emphasis on ISO 9000; Functions of Software QA Organization in A Project; Interactions with Developers; Quality Plans, Quality Assurance Towards Quality Improvement; Role of Independent Verification & Validation; Total Quality Management; SEI Maturity Model; Software Metrics.

UNIT-IV (11 Hrs)

Configuration Management: Need for Configuration Management; Configuration Management Functions and Activities; Configuration Management Techniques; Examples and Case Studies. **Software Testing Fundamentals**: Basic Terminology, Testing Techniques and Strategies. Brief Introduction to Various Standards Related to Software Engineering.

Recommended Book

1. Roger Pressman, 'Software Engineering - A Practitioners Approach', McGraw Hill.
2. Ian Sommerville, 'Software Engineering', Addison-Wesley Publishing Company.
3. James F. Peter, 'Software Engineering - An Engineering Approach', John Wiley.
4. Pankaj Jalote, 'An integrated Approach to Software Engineering', Narosa.

ADVANCED INTERNET & WEB TECHNOLOGIES

Subject Code – MITE3-160 **L T P C** **Duration - 45 Hrs**

3 1 0 4

UNIT-I (10 Hrs)

Introduction: Internet Protocol Model, Internet Addresses, IP Routing Concepts, Table Driven and Next Hop Routing, Other Routing Related Protocols, Internet Access Through PPP, SLIP, WWW, Web Servers, Browsers.

UNIT-II (12 Hrs)

Name Services and Configuration: DNS, DHCP, X500 Directory Services, LDAP, Internet Security, Authentication and Encryption, Watermarks, Firewall, SSL, Digital Signatures. **Web Services:** Web Services, Evolution and Differences with Distributed Computing, XML, WSDL, SOAP, UDDI, Transactions, Business Process Execution Language for Web Services, WS-Security and The Web Services Security Specifications, WS-Reliable Messaging, WS-Policy, WS-Attachments. Web 2.0 Technologies: Introduction to Ajax, Ajax Design Basics, Java script, Blogs, Wikis, RSS Feeds.

UNIT-III (11 Hrs)

Content Delivery and Preparation: Introduction to WWW, TCP/IP, HTTP, FTP, UDP, N-Tier, Markup Languages VRML– HTML, DHTML, DNS, URL, Browsers, Platform for Web Services Development, MVC Design Pattern, .NET, J2EE Architecture, J2EE Components & Containers, Specification, Application Servers, Struts.

UNIT-IV (12 Hrs)

Dynamic Web Programming: Java Applets, Java Script, JSP, JSTL, ASP, PHP, Servlets, Servlet Life Cycle, C#, Component Technologies, Java Beans, CORBA, Introduction to Ejbs, JDBC, Secure Electronic Transactions Over Web.

Introduction to Cloud Computing: Cloud Computing- History Of Cloud Computing, Cloud Architecture, Cloud Storage, Why Cloud Computing Matters, Pros and Cons Of Cloud Computing, Companies in The Cloud Today, Cloud Services.

Recommended Books

1. E. Balagurusamy, 'Programming with Java', 4th Edn., Tata McGraw-Hill Education, **2009.**
2. E. Ladd, and J. O'Donnell, 'Platinum Edition Using Xhtml, Xml and Java 2', 4th Edn., Que Publishing, **2001.**
3. P.J. Deitel, H. Deitel and A. Deitel, 'Internet and World Wide Web How to Program', 5th Edn., India: Pearson Education Limited, **2011.**
4. M. Miller, August, 'Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online', Que Publishing, **2008.**