

NIMS UNIVERSITY, JAIPUR



SYLLABUS

M. TECH.

(INFORMATION TECHNOLOGY)

SEMESTER - I

Teaching and Examination Scheme

Sr. NO.	Course No.	Title	L	T	P	Internal	Exam .	Total
1.	1MTIT1	Wireless communication technologies	2	1		25	100	100
2.	1MTIT2	Information System Security	2	1		25	100	100
3.	1MTIT3	Advanced Data Structure	2	1		25	100	100
4.	1MTIT4	Advanced Computer Networks	2	1		25	100	100
		Total	8	4		100	400	500

1MTIT2: WIRELESS COMMUNICATION TECHNOLOGIES

Course No.: 1MTIT1
L-T-P Structure: 2-1-0

Course Title: WCT
Maximum Marks Theory: 100

Overview of Third Generation (3G) in wireless:

Universal Mobile Telecommunication Service (UMTS), UMTS Service and Air interface, 3GPP network architectures, CDMA2000, TD-CDMA and TD-SCDMA Technologies.

Evolution of 2.5G:

Enhancement over 2G, GPRS and EDGE network services and architectures, traffic dimensioning, CDMA2000 (1XRTT), WAP and SMS, migration path from 2G to 2.5G to 3G

UMTS:

UMTS basics, WCDMA interface, UTRAN architecture, establishment of UMTS speech cells, UMTS packet data (R99), High speed packet data handover and UMTS core network evolution

CDMA 2000:

Radio components, Network structure packet data transport flow, Radio network (IS- 2000 1XRTT), EVDO.

TD-SCDMA:

Architecture and code network, Radio network, Interface Migration Technique RAN Traffic planning.

TD-CDMA:

Generic TD-CDMA architecture, code networks, Radio Network, Interface migration technique RAN traffic planning.

VoIP Technology:

Basis of IP transport, VoIP challenges, H-323, session invitation protocol, distributed architecture & media gateway control, VoIP and SS7 VoIP quality of service.

Broadband:

Wi-Fi 802.11, 802.16, Bluetooth and cable system

Antenna System Selection:

Base Station antenna, performance criteria, Diversity, cross pole antenna, dual band antenna dBi and dBd

References:

1. Smith & Collins, "3G Wireless Networks", TMH, 2007.
2. Theodore S. Rapp port, "Wireless Communication- Principles and practices," 2nd Ed., Pearson Education Pvt. Ltd, 2003.

1MTIT2. Information System Security

Course No.: 1MTIT2
L-T-P Structure: 2-1-0

Course Title: Information System Security
Maximum Marks Theory: 100

Multi level model of security, Cryptography, Secret Key Cryptography, Modes of Operation, Hashes and Message Digest, Public Key Algorithm, Security Handshake Pitfall, Strong Password Protocol; Case study of real time communication security; Introduction to the Concepts of Security, Security Approaches, Principles of security, Types of attacks; Cryptographic Techniques: Plain text and Cipher text , Substitution Techniques, Transposition Techniques Encryption and Decryption, Symmetric and Asymmetric Key Cryptography. Computer-based symmetric Key Cryptographic; Algorithms: Algorithm Types and Modes, An Overview of Symmetric Key Cryptography, Data Encryption Standard (DES), International Data Encryption Algorithm (IDEA), Advanced Encryption Standard (AES); Computer-based Asymmetric Key Cryptographic Algorithms; Cryptography, An Overview of Asymmetric Key Cryptography, The RSA algorithm, Symmetric and Asymmetric Key Cryptography Together, Digital Signatures, Knapsack Algorithm; Public Key Infrastructure (PKI) Digital Certificates, Private Key Management , The PKI Model, Public Key Cryptography Standards (PKCS); Internet Security Protocols Secure Socket Layer (SSL) , Secure Hyper Text Transfer Protocol (SHTTP) , Time Stamping Protocol (TSP), Secure Electronic Transaction (SET), SSL 5 I versus SET, 3-D Secure Protocol , Electronic Money , Email Security; User Authentication Mechanisms : Authentication Basics, Passwords, Authentication Tokens, Certificate-based Authentication; Practical Implementations of Cryptography/Security: Cryptographic Solutions Using Java, Cryptographic Solutions Using Microsoft, Cryptographic Toolkits, Security and Operating Systems; Network Security: Brief Introduction to TCP/IP, Firewalls, IP Security, Virtual Private Networks (VPN); Case Studies on Cryptography and Security:

Reference:

1. Atul Kahate "Cryptography and Network Security" Tata McGraw-Hill
2. Charlie Kaufman, Radia Perlman, Mike Speciner "Network Securities" Pearson,
3. J. A. Coopeer "Computer Communication Securities" TMH,
4. D.W. Davies W. L. Price "securities For computer Networks"

1MTIT3: Advanced Data Structures

Course No.: 1MTIT3
L-T-P Structure: 2-1-0

Course Title: Advanced Data Structure
Maximum Marks Theory: 100

The Role of Algorithm in Computing, Algorithms as technology, Analyzing algorithms, Designing algorithm, Growth Function: Asymptotic notational and function. Randomized Algorithms: Use of probabilistic inequalities in analysis & applications. Graph algorithms: Representation of graph, Breath- first, Depth-first search, the algorithms of kruskal and prim, Maximum flow: Flow networks, The ford Fulkerson method, maximum bipartite matching, Approximation Algorithms: The vertex-cover algorithms, The traveling – salesman problem, The set covering problem. Dynamic programming: Rod cutting, Matrix chain multiplication, Element of dynamic programming, Greedy algorithms. Type of weighted balanced tree, Merge able Heaps, 2-3-4 tree, Sorting and Flow networks.

1MTIT 6: Advanced Computer Networks

Course No.: 1MTIT 6
L-T-P Structure: 3-1-0

Course Title: Advanced Computer Networks
Maximum Marks Theory: 100

OSI Application Layer Service Elements-e.g. FTAM, virtual terminal protocol, X.400 message handling. Network Services and Applications-X.500 directory services, information retrieval, online transaction processing, electronic mail, conferencing and EDI. Protocols-Routing and switching protocols functions, design, implementation and testing. RIP version1 & 2, VLAN, STP, Architectures, Standards and Protocols-TCP OSI/IP, connectionless and connection-oriented protocols, protocol stacks. Network Design, Performance, Operation and Management-architecture, interoperability and open systems issues. Distributed Systems-client/server model, workstations, distributed operating systems, remote procedure call. Routing Advance protocols: OSPF, EIGRP, BGP, IS-IS installation and confirmation in details Local and Metropolitan Area Networks-Ethernet, token ring and FDDI-I and II, DQDB - principles and components. Internetworking-bridges and routers, Internet design and evolution.Integrated Data Networks-narrow band and broadband ISDN, and associated protocols (e.g. SSL7, ATM), CTI. Wide Area Networks-X.25 packet switching principles, protocols and components, frame relay, cell switching, routing. Security and Reliability of Networks-fault-tolerant and safety/mission critical systems, encryption, access control, network virus problems.

Reference:

1. Comer DE, (1995), Internet working with TCP/IP Vol. 1, 3e, Prentice-Hall.
2. Kessler G and Train D, (1992), Metropolitan Area Networks, McGraw-Hill.
3. Feit S, (1993), TCP/IP, McGraw-Hill.
4. Stallings W, (1997), Data and Computer Communications 5e, Macmillan.

SEMESTER - II

Sr. NO.	Course No.	Title
1	2MTIT1	Enterprise computing in java J2EE
2.	2MTIT2	Distributed Algorithms
3.	2MTIT3	Mobile Computing
4.	2MTIT4	Network Programming
5.		Project/ Presentation

SEMESTER – III

Sr. NO.	Course No.	Title
1.	3MTIT1	Parallel and Distributed Computing
2.	3MTIT2	Information storage & management
3.	3MTIT3	Dissertation Part-I/ Seminar
		Total

SEMESTER -IV

Sr. NO.	Course No.	Title
1	4MTIT1	Dissertation Part-II
2.	4MTIT2	Course Work